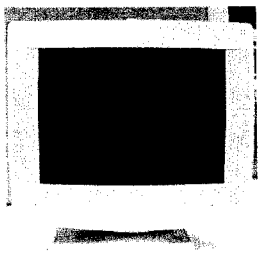
17", 19" Auto scan Color Monitor

Service
Service
Service

17A580BQ/74C
19A580BQ/74C



MANUAL 6604
PCEC Model: 17A580 BQ11
19A580 BQ11
Chassis: CM5800
File: 1997: 6604

EPA POLLUTION PREVENTER

DDC/Audio/Power saving/Tilt correction

Service Manual

Horizontal frequencies
30 - 95 kHz

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REFER TO BACK COVER FOR IMPORTANT SAFETY GUIDELINES

SAFETY NOTICE

ANY PERSON ATTEMPTING TO SERVICE THIS CHASSIS MUST FAMILIARIZE HIMSELF WITH THE CHASSIS AND BE AWARE OF THE NECESSARY SAFETY PRECAUTIONS TO BE USED WHEN SERVICING ELECTRONIC EQUIPMENT CONTAINING HIGH VOLTAGES.

CAUTION: USE A SEPARATE ISOLATION TRANSFORMER FOR THIS UNIT WHEN SERVICING.

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PCS 89 991

PHILIPS

IMPORTANT SAFETY NOTICE

Proper service and repair is important to the safe, reliable operation of all Philips Consumer Electronics Company** Equipment. The service procedures recommended by Philips and described in this service manual are effective methods of performing service operations. Some of these service operations require the use of tools specially designed for the purpose. The special tools should be used when and as recommended.

It is important to note that this manual contains various CAUTIONS and NOTICES which should be carefully read in order to minimize the risk of personal injury to service personnel. The possibility exists that improper service methods may damage the equipment. It also is important to understand that these CAUTIONS and NOTICES ARE NOT EXHAUSTIVE. Philips could not possibly know, evaluate and advise the service trade of all conceivable ways in which service might be done or of the possible hazardous consequences of each way. Consequently, Philips has not undertaken any such broad evaluation. Accordingly, a servicer who uses a service procedure or tool which is not recommended by Philips must first satisfy himself thoroughly that neither his safety nor the safe operation of the equipment will be jeopardized by the service method selected.

** Hereafter throughout this manual, Philips Consumer Electronics Company will be referred to as Philips.

WARNING

Critical components having special safety characteristics are identified with a ⚠ by the Ref. No. in the parts list and enclosed within a broken line* (where several critical components are grouped in one area) along with the safety symbol ⚠ on the schematics or exploded views.

Use of substitute replacement parts which do not have the same specified safety characteristics may create shock, fire, or other hazards.

Under no circumstances should the original design be modified or altered without written permission from Philips. Philips assumes no liability, express or implied, arising out of any unauthorized modification of design. Servicer assumes all liability.

* Broken Line ▬ ▪ ▬ ▪ ▬ ▪

FOR PRODUCTS CONTAINING LASER :
DANGER- Invisible laser radiation when open. AVOID DIRECT EXPOSURE TO BEAM.
CAUTION- Use of controls or adjustments or performance of procedures other than those specified herein may result in hazardous radiation exposure.
CAUTION- The use of optical instruments with this product will increase eye hazard.

TO ENSURE THE CONTINUED RELIABILITY OF THIS PRODUCT,USE ONLY ORIGINAL MANUFACTURER'S REPLACEMENT PARTS,WHICH ARE LISTED WITH THEIR PART NUMBERS IN THE PARTS LIST SECTION OF THIS SERVICE MANUAL.

Hex Data of DDC1/2B (17A580BQ/74C)

```
**********************************************************
                      ddc_v17.chk
**********************************************************

Vendor/Product Identification
        ID Manufacturer Name        : PHL
        ID Product Code             : 1107
        ID Serial Number            : 12345678
        Week of Manufacture         : 38
        Year of Manufacture         : 1997

EDID Version, Revision
        Version                     : 1
        Revision                    : 1

Basic Display Parameters/Features
        Video Input Definition      : Analog Video Input
                                      0.700V/0.300V (1.00Vpp)
                                      without Blank-to-Black Setup
                                      Separate Sync
                                      Composite Sync
                                      Sync on Green
                                      no Serration required

        Maximum H Image Size        : 30 cm
        Maximum V Image Size        : 23 cm

        Display Transfer Characteristic: 2.850
                (gamma)

        Feature Support (DPMS)      : Standby
                                      Suspend
                                      Active Off
                                      RGB color display

Color Characteristics
        Red  X coordinate           : 0.625
        Red  Y coordinate           : 0.340
        Green X coordinate          : 0.285
        Green Y coordinate          : 0.605
        Blue  X coordinate          : 0.150
        Blue  Y coordinate          : 0.065
        White X coordinate          : 0.283
        White Y coordinate          : 0.298

Established Timings
        Established Timings I       : 640 x 480 @60Hz (VGA,IBM)
                                      640 x 480 @75Hz (VESA)

        Established timings II      : 800 x 600 @75Hz (VESA)
                                      1024 x 768 @75Hz (VESA)
                                      1280 x 1024 @75Hz (VESA)

        Manufacturer's timings      : 1152 x 870 @75Hz
                                      (MacII,Apple)

Standard Timing Identification #1
        Horizontal active pixels    : 640
        Aspect Ratio                : 4:3
        Refresh Rate                : 70

Standard Timing Identification #2
        Horizontal active pixels    : 800
        Aspect Ratio                : 4:3
        Refresh Rate                : 85

Standard Timing Identification #3
        Horizontal active pixels    : 1024
        Aspect Ratio                : 4:3
        Refresh Rate                : 85

Standard Timing Identification #4
        Horizontal active pixels    : 1280
        Aspect Ratio                : 5:4
        Refresh Rate                : 85

Standard Timing Identification #5
        Horizontal active pixels    : 1600
        Aspect Ratio                : 4:3
        Refresh Rate                : 75

Detailed Timing #1
        Pixel Clock (MHz)           : 108.000
        H Active (pixels)           : 1152
        H Blanking (pixels)         : 352
        V Active (lines)            : 900
        V Blanking (lines)          : 43
        H Sync Offset (F Porch) (pixels): 16
        H Sync Pulse Width (pixels) : 64
        V Sync Offset (F Porch) (lines): 2
        V Sync Pulse Width (lines)  : 8
        H Image Size (mm)           : 300
        V Image Size (mm)           : 225
        H Border (pixels)           : 0
        V Border (lines)            : 0
        Flags                       : Non-interlaced
                                      Normal Display, No stereo
                                      Digital Seperate Sync
                                      Positive V Sync
                                      Positive H Sync

Monitor Descriptor #2
        Serial Number               : CM58C12345678

Monitor Descriptor #3
        Monitor Name                : TYPHOON17A

Monitor Descriptor #4
        Min. Vt rate Hz             : 50
        Max. Vt rate Hz             : 160
        Min. Horiz. rate kHz        : 30
        Min. Horiz. rate kHz        : 95
        Max. Supported Pixel not specified

Extension Flag                      : 0

Check sum                           : 5e(hex)
```

Hex Data of DDC1/2B (17A580BQ/74C)

0: 0	1: ff	2: ff	3: ff	4: ff	5: ff	6: ff	7: 0
8: 41	9: c	10: 7	11: 11	12: 4e	13: 61	14: bc	15: 0
16: 26	17: 7	18: 1	19: 1	20: e	21: 1e	22: 17	23: b9
24: e8	25: 0	26: b9	27: a0	28: 57	29: 49	30: 9b	31: 26
32: 10	33: 48	34: 4c	35: 24	36: 43	37: 80	38: 31	39: 4a
40: 45	41: 59	42: 61	43: 59	44: 81	45: 99	46: a9	47: 4f
48: 1	49: 1	50: 1	51: 1	52: 1	53: 1	54: 30	55: 2a
56: 80	57: 60	58: 41	59: 84	60: 2b	61: 30	62: 10	63: 40
64: 28	65: 0	66: 2c	67: e1	68: 10	69: 0	70: 0	71: 1e
72: 0	73: 0	74: 0	75: ff	76: 0	77: 43	78: 4d	79: 35
80: 38	81: 43	82: 31	83: 32	84: 33	85: 34	86: 35	87: 36
88: 37	89: 38	90: 0	91: 0	92: 0	93: fc	94: 0	95: 54
96: 59	97: 50	98: 48	99: 4f	100: 4f	101: 4e	102: 20	103: 31
104: 37	105: 41	106: a	107: 20	108: 0	109: 0	110: 0	111: fd
112: 0	113: 32	114: a0	115: 1e	116: 5f	117: ff	118: 0	119: a
120: 20	121: 20	122: 20	123: 20	124: 20	125: 20	126: 0	127: 5e

Hex Data of DDC1/2B (19A580BQ/74C)

Display data channel :DDC1/2B

Vendor/Product Identification
ID Manufacturer Name : PHL
ID Product Code : 1109
ID Serial Number : 12345678
Week of Manufacture : 36
Year of Manufacture : 1997

EDID Version, Revision
Version : 1
Revision : 1

Basic Display Parameters/Features
Video Input Definition : Analog Video Input
0.700V/0.300V (1.00Vpp)
without Blank-to-Black Setup
Separate Sync
Composite Sync
without Sync on Green
no Serration required

Maximum H Image Size : 34 cm
Maximum V Image Size : 25 cm

Display Transfer Characteristic (gamma) : 2.760

Feature Support (DPMS) : Standby
Suspend
Active Off
RGB color display

Color Characteristics
Red X coordinate : 0.625
Red Y coordinate : 0.340
Green X coordinate : 0.285
Green Y coordinate : 0.605
Blue X coordinate : 0.150
Blue Y coordinate : 0.065
White X coordinate : 0.283
White Y coordinate : 0.298

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Established Timings I : 640 x 480 @60Hz (VGA,IBM)
640 x 480 @75Hz (VESA)

Established Timings II : 800 x 600 @75Hz (VESA)
1024 x 768 @75Hz (VESA)
1280 x 1024 @75Hz (VESA)

Manufacturer's Timings : 1152 x 870 @75Hz
(MacII, Apple)

Standard Timing Identification #1
Horizontal active pixels : 800
Aspect Ratio : 4:3
Refresh Rate : 85

Standard Timing Identification #2
Horizontal active pixels : 1024
Aspect Ratio : 4:3
Refresh Rate : 85

Standard Timing Identification #3
Horizontal active pixels : 1280
Aspect Ratio : 5:4
Refresh Rate : 85

Standard Timing Identification #4
Horizontal active pixels : 1600
Aspect Ratio : 4:3
Refresh Rate : 75

Detailed Timing #1
Pixel Clock (MHz) : 202.500
H Active (pixels) : 1600
H Blanking (pixels) : 560
V Active (lines) : 1200
V Blanking (lines) : 50
H Sync Offset (F Porch) (pixels) : 304
H Sync Pulse Width (pixels) : 192
V Sync Offset (F Porch) (lines) : 46
V Sync Pulse Width (lines) : 3
H Image Size (mm) : 340
V Image Size (mm) : 255
H Border (pixels) : 0
V Border (lines) : 0
Flags : Non-interlaced
Normal Display, No stereo
Digital Separate Sync
Positive V Sync
Positive H Sync

Monitor Descriptor #2
Serial Number : 5800C12345678

Monitor Descriptor #3
Monitor Name : TYPHOON19A

Monitor Descriptor #4
Min. Vt rate Hz : 50
Max. Vt rate Hz : 160
Min. Horiz. rate kHz : 30
Min. Horiz. rate kHz : 95
Max. Supported Pixel not specified

Extension Flag : 0

Check sum : 5e(hex)

Hex Data of DDC1/2B (19A580BQ/74C)

For Hitachi CRT

0: 0	1: ff	2: ff	3: ff	4: ff	5: ff	6: ff	7: 0
8: 41	9: c	10: 9	11: 11	12: 4e	13: 61	14: bc	15: 0
16: 24	17: 7	18: 1	19: 1	20: c	21: 22	22: 19	23: b0
24: e8	25: 0	26: b9	27: a0	28: 57	29: 49	30: 9b	31: 26
32: 10	33: 48	34: 4c	35: 24	36: 43	37: 80	38: 45	39: 59
40: 61	41: 59	42: 81	43: 99	44: a9	45: 4f	46: 1	47: 1
48: 1	49: 1	50: 1	51: 1	52: 1	53: 1	54: 1a	55: 4f
56: 40	57: 30	58: 62	59: b0	60: 32	61: 40	62: 30	63: c0
64: e3	65: 48	66: 54	67: ff	68: 10	69: 0	70: 0	71: 1e
72: 0	73: 0	74: 0	75: ff	76: 0	77: 35	78: 38	79: 30
80: 30	81: 43	82: 31	83: 32	84: 33	85: 34	86: 35	87: 36
88: 37	89: 38	90: 0	91: 0	92: 0	93: fc	94: 0	95: 54
96: 59	97: 50	98: 48	99: 4f	100: 4f	101: 4e	102: 20	103: 31
104: 39	105: 41	106: a	107: 20	108: 0	109: 0	110: 0	111: fd
112: 0	113: 32	114: a0	115: 1e	116: 5f	117: ff	118: 0	119: a
120: 20	121: 20	122: 20	123: 20	124: 20	125: 20	126: 0	127: 8e

a: Service DDC Kit

DDC Module (DDC cable), Part number = 4822 320 12004
DDCV2N.EXE software (3.5" disk), Part number = 4822 711 00024

b: Please refer to Service Information 4822 727 21995 for using the Service DDC Kit.

Warning and Notes

Warnings

1. Safety regulations require that the unit should be returned in its original condition and that components identical to the original components are used. The safety components are indicated by the symbol ⚠ .

2. In order to prevent damage to ICs and transistors, all high-voltage flash-overs must be avoided. In order to prevent damage to the picture tube, the method shown in Fig. 1 should be used to discharge the picture tube. Use a high-voltage probe and a multimeter (position DC-V). Discharge until the meter reading is **0 V** (after approximately 30 seconds).

3. **ESD**
   All ICs and many other semiconductors are sensitive to electrostatic discharges (ESD). Careless handling during repair can drastically shorten their life. Make sure that during repair you are connected by a pulse band with resistance to the same potential as the ground of the unit. Keep components and tools also at this same potential.

4. When repairing a unit, always connect it to the AC Power voltage via an isolating transformer.

5. Be careful when taking measurements in the high-voltage section and on the picture tube panel.

6. It is recommended that saferty goggles be worn when replacing the picture tube.

7. When making adjustments,use plastic rather than metal tools. This will prevent any short-circuit or the danger of a circuit becoming unstable.

8. Never replace modules or other components while the unit is switched on.

9. Together with the defleciton unit, the picture tube is used as an integrated unit. Adjustment of this unit during repair is not recommended.

10. After repair, the wiring should be fastened in place with the cable clamps.

Notes

1. The direct voltages and waveforms are average voltages. They have been measured using the Service test software and under the following conditions :
   - Mode : 1024 * 768 (56.5kHz / 70Hz)
   - Signal pattern : grey scale
   - Adjust brightness and contrast control for the mechanical mid-position (click position)

2. The picture tube panel has printed spark gaps. Each spark gap is connected between an electrode of the picture tube and the Aquadag coating.

3. The semiconductors indicated in the circuit diagram(s) and in the parts lists are completely interchangeable per position with the semiconductors in the unit, irrespective of the type indication on these semiconductors.

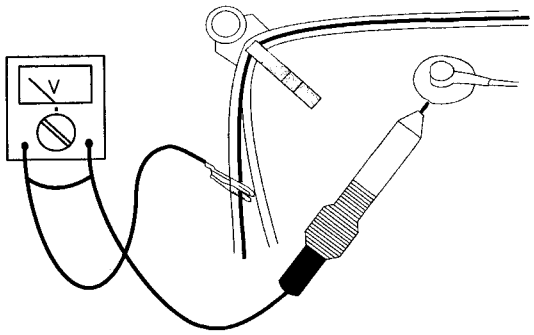


Fig.1

Electrical Adjustments

0. General

When carry-out the electrical settings in many cases a video signal must be applied to the monitor. A computer with :

- ATI GPT-1600 (4822 397 10065), Mach 64 (up to 107kHz)

are used as the video signal source. The signal patterns are selected from the "service test software" package, see user guide 4822 727 21046 (GPT-1600).

0.1 This monitor has 12 factory-preset modes as below.

640 x 400 31.5 kHz/70 Hz	1152 x 870 68.7 kHz/75 Hz
640 x 480 31.5 kHz/60 Hz	1152 x 900 71.8KHz/76Hz
640 x 480 37.5 kHz/75 Hz	1280 x 1024 80.0 kHz/75 Hz
800 x 600 46.9 KHz/75Hz	1280 x 1024 91.1 kHz/85Hz
800 x 600 53.7 kHz/85Hz	1600 x 1200 93.7 kHz/75 Hz
1024 x 768 60.0 kHz/75 Hz	
1024 x 768 68.7 kHz/85 Hz	

0.2 With normal VGA card:
If not using the ATI card during repair or alignment, The service engineer also can use this service test software adapting with normal standard VGA adaptor and using standard VGA mode 640 x 480, 31.5 kHz/60 Hz (only) as signal source.

0.3 AC/DC Measurement:
The measurements for AC waveform and DC figure is based on 640 x 480 31.5 kHz/60 Hz resolution mode with test pattern "gray scale". Power input: 110V AC

1. B+ supply voltage (3194) 185Vdc

- Apply a video signal in the 1024 x 768 with 69 kHz/85Hz mode.
- Select the "cross-hatch" pattern.
- Set the brightness control and the contrast control to the minimum position.
- Pre-set trimming potentiometer 3194(+) and 3644(EHT) in mid-position.
- Set Vg2 (screen) to fully Counter-clockwise (zero beamcurrent).
- Connect a dc voltmeter between the joint of capacitor 2181 and ground (common ground).
- Set the B+ trimming potentiometer 3194 so that the reading on the dc voltmeter is 185 V +/- 0.5 Vdc.

2. High-voltage EHT (3644)

- Apply a video signal in the 1024 * 768 with 69 kHz/85Hz mode.
- Select the "cross-hatch" pattern.
- Set the brightness control and the contrast control to the minimum position.
- Turn off the power.
- Connect a "high-voltage voltmeter" between the high-voltage connection of the picture tube and earth.
- Turn on the power.
- Set the EHT trimming potentiometer 3644 so that the "high-voltage voltmeter" reads 26.0 kV +/- 0.2 kV (for 19").
  25.0 kV +/- 0.2 kV (for 17").

- Turn off the power.
- Remove the "high-voltage voltmeter" from the picture tube.
- Turn on the power again.
- Remove the "high-voltage voltmeter" from the picture tube.
- Turn on the power again.

3. Monitor the following auxiliary voltages.

+ 12.0V SOURCE ACROSS C2192 + 12.0V +/- 0.5VDC.
+ 15.0V SOURCE ACROSS C2187 + 15.0V +/- 1.0VDC.
- 15.0V SOURCE ACROSS C2189 - 15.0 V+/- 1.0VDC.
+ 6.3 V SOURCE ACROSS D6195"-" 6.3V +/- 0.5VDC.
+125.0V SOURCE ACROSS C2182 +125.0V +/- 2.0VDC.
+185.0V SOURCE ACROSS C2181 + 185.0V +/- 1.5VDC.
+ 81.0V SOURCE ACROSS C2185 + 81.0 V +/- 2.0VDC.

4. General conditions for alignment

4.1 During all alignments, supply a distortion free AC mains voltage to set via an isolating transformer with low internal impedance.
4.2 Align in pre-warmed condition, at least 30 minutes warm-up with nominal picture brightness.
4.3 Purity, geometry and subsequent alignments should be carried out in magnetic cage with correct magnetic field.

Northern hemisphere : H=0, V=430 mG, Z=0
Southern hemisphere : H=0, V=-520 mG, Z=0
Equatorial Support : H=0, V=0 mG, Z=0

4.4 All voltages are to be measured or applied with respect to ground.
Note: Do not use heatsink as ground.
4.5 Adjust function controls " " to center position except for contrast control which should be set to MAX.
4.6 Apply a video signal in the 1280 x 1024 with 64kHz/60Hz mode, select cross hatch pattern, set the Brightness for visible raster, adjust H-size for 340mm (19" monotor)/300mm (17" monitor) "raster width", adjust R3551 for Horizontal raster center.

5. To access factory mode:

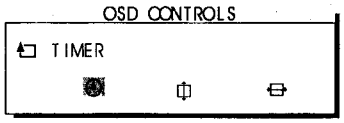
- Turn off monitor (don't turn off PC)
- Press " " and " " simultaneously on the front control panel , untill the OSD menu with characters " factory mode (below OSD menu)" come on the screen of monitor.
- If OSD menu disappears on the screen of monitor, press " " again (anytime), then the OSD menu comes on the screen again.
- using " " : to select OSD menu.
  : to increase or decrease the setting.

(Please also refer to page 4,5,6 and 7 for OSD adjustment)
- Using " " to confirm the selection.

5.1. To leave factory mode

* After alignment of factory mode, turn off monitor (if you do not turn off monitor, the OSD menu is always at the factory mode), then turn on monitor again (at this moment, the OSD menu goes back to user mode).

6. OSD CONTROLS (During alignment)
During alignment, please use the "OSD controls" to keep OSD menu, or to shift OSD menu as below.



TIMER Set OSD display time, **select "OFF", then the OSD menu will stay on the screen (won't disappear).**
VERTICAL POSITION Move the OSD windows up or down.
HORIZONTAL POSITION Move the OSD window left or right.

USB Connections

If you have Windows '95...

follow these steps to complete setting up your monitor.

1. Start Windows '95 and install CD ROM supplied with this monitor.
2. Click on the "START" icon. Next, click on the"SETTINGS" icon. Then click on "CONTROL PANEL."
3. Double-click on "DISPLAY" icon. Next, click on "SETTINGS" tab.Then click on "ADVANCED PROPERTIES"dialog box.
4. Click on "MONITOR" tab.

5.(a) If you have an old computer, click on"CHANGE" dialog box. Next,"SELECT DEVICE" screen appears. Now click on " HAVE DISK" dialog box. and select CD-ROM drive

Or

5.(b) If you have a new compter,"SELECT DEVICE" screen automatically appears. Click on " HAVE DISK" dialog box and select CD-ROM drive.

6. Select"OK" in the " INSTALL FROM DISK" dialog box. If model name of the Philips monitor is correct, click "OK" tab in the " SELECT DEVICE" dialog box.
7. Click " CLOSE "tab in the " ADVANCED PROPERTIES" dialog box. If your Windows'95 version is different or you need more detailed installation information, please refer to the windows '95 user's manual. **For additional information on the monitor, please refer to the owner's manual.**

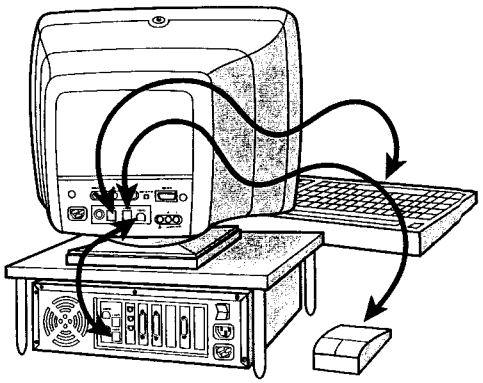
USB CONNECTIONS

USB (Universal Serial Bus) is an innovation in connecting your IBM- compatible computer to your monitor.By using the USB, you will be able to connect your keyboard, mouse,printer, and other peripherals to your monitor instead of having to connect them to your computer. This will give you greater flexibility in setting up your system.Plus, you will have true plug-and-play capability. While the software is still being developed,Philips has included the hardware so you will be ready to take advantage of this next generation in computer development.

For an IBM-compatible Computer:

1. Turn off the computer.
2. Connect the (optional) USB Hub and cable to the computer and to the monitor. (Computer must have USB port.)
3. Connect the power cable.
4. Turn on the monitor. Then turn on the computer.
5. With the installation of the correct software,you will be able to connect specially-made peripherals to the monitor.

Note : USB Hub and cables sold separately.USB Bay exists in back of monitor.



Use the information file (philips.inf) for Windows'95

(Philips Monitors-Driver Disk)

Philips' monitors build in VESA DDC1/2B feature to support Plug & Play requirement for Windows'95. You can install this information file (philips.inf) in order to select your Philips monitor from"Monitor" dialog box in Windows 95 to activate Plug & Play application. The installation procedure based on Windows '95 OEM Release 2 is specified as follows,

1. Start Windows'95
2. Click the'Start' button, point to'Settings', and then click'Control Panel'
3. Double-click the 'Display' icon, select the 'Settings' tab, then select "Advanced Properties"tab.
4. Select"Ok" in the"Install From Disk"dialog box.
5. Now, you can see the Philips monitor is appeared.
6. If the model name of Philips monitor is correct, click'Ok" tab in "Select Device" dialog box.
7. Then, click"Close" tab in "Advanced Properties"dialog box.
8. Now, you can select"Refresh Rate" to change monitor resolution

If your Windows'95 version is different or you need more detail installation information, please refer to Windows 95 user's manual.

Electrical Adjustments (Continued)

7. Alignment of Vg2 cut-off point, white tracking (OSD control)

Equipment : 1. Video Test Generator-801GC (Quantum Data)
2. Color-analyzer (Minolta CA-100)

VG2 [(screen), at the bottom of the L.O.T.].
* Apply a video signal in the 1024 x 768 with 69 kHz/85 Hz mode, select the "full white pattern".
* Use color-analyzer (Minolta CA-100) to adjust cutoff and white uniformity.

OSD R/G/B cut-off and R/G/B gain can be accessed, with initial data:
R cutoff = 50%, R gain = 70%
G cutoff = 50%, G gain = 70%
B cutoff = 50%, B gain = 70%

Step 1: To select the character "FACTORY MODE" as shown in Fig. 2.1, press " ▣ " to access the OSD menu for R/G/B gain & cutoff as shown in Fig. 2.2.
Step 2: Use " ⟲ " to increase or decrease the value as shown in Fig. 2.3.

Fig. 2.1

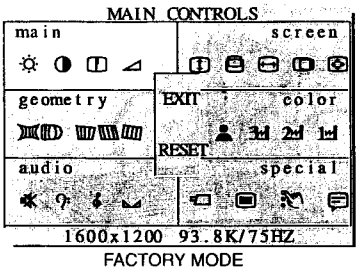
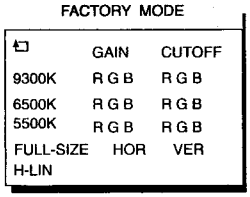


Fig. 2.2



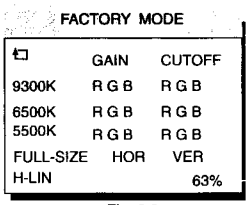


Fig. 2.3

7.1 Connect the video input, set brightness control at 50% and contrast at minimum position, Vg2 at Minimum (counter clockwise, and ABL (3647, potentiometer) at center position. Slowly increase Vg2 voltage until light output is at 0.17Ft-L +/- 0.05Ft-L (Y=0.17Ft-L, on the screen of CA-100) .

7.2 (The screen of monitor is dark now)
: Press " ▣ " to show the OSD menu as shown in Fig. 2.1.
: Select the character "FACTORY MODE" to access the R/G/B adjustment as shown in Fig. 2.2 and Fig. 2.3.
: Adjust the cutoff of R/G/B to get 9300K (x=0.281 +/- 0.015, y=0.311 +/- 0.015), and brightness output at 0.17 +/- 0.05 Ft-L (Y=0.17Ft-L).

7.3 : Press " ◑ " to set contrast at maximum (100%).
: Adjust gain of R/G/B to get 9300K (x=0.281 +/- 0.015, y=0.311 +/-0.015, don't care about the Y value)

7.4 Apply a small white square 60 x 60 mm pattern, or 8% fill of full screen, brightness set to center (50%), and contrast at maximum (100%), adjust gain control (OSD) to reach 34 +/- 2 Ft-L.

7.5 : Select the 6500K colour temperature as shown in Fig. 2.2.
: Adjust the R/G/B cutoff and R/G/B gain as shown in procedure 7.2~7.4 to get R/G/B cutoff x= 0.313 +/- 0.015
y= 0.329 +/- 0.015
Y= 0.17 +/- 0.05 Ft-L
R/G/B gain x= 0.313 +/- 0.015
y= 0.329 +/- 0.015
Y= 30 +/- 2 Ft-L

7.6 : Select the 5500K colour temperature as shown in Fig. 2.2.
: Adjust the R/G/B cutoff & R/G/B gain as procedure 7.2~7.4

to get R/G/B cutoff x= 0.332 +/- 0.015
y= 0.347 +/- 0.015
Y= 0.17 +/- 0.05 Ft-L
R/G/B gain x= 0.332 +/- 0.015
y= 0.347 +/- 0.015
Y= 25 +/- 2 Ft-L

7.7 Apply full white pattern at 9300K, adjust ABL R3647 to reach 31 +/- 2 Ft-L (19")(contrast at maximum, brightness at center). 30 +/- 2 Ft-L (for 17" monitor).

8. Picture geometry setting (factory pre-set modes)

- Apply a video signal with cross-hatch pattern.
- Apply a video signal in the 1024 x 768 with 69 kHz/85 Hz mode.
- Set brightness and contrast controls to their center positions (OSD control).

8.1 Horizontal geometry (OSD control)
- Adjust the H-width to 340 mm (for 19" monitor).
300 mm (for 17" monitor).
- Adjust the H-phase to center position.

8.2 Vertical geometry (OSD control)
- Adjust vertical size to 255 mm (for 19" monitor).
225 mm (for 17" monitor).
- Adjust V-phase to center position.

8.3 Trapezoid distortion (OSD control)
- Adjust the trapezoid to get optimal vertical lines.

8.4 Pincushion (OSD control)
- Adjust the pincushion to get optimal vertical line.

8.5 Parallelogram (OSD control)
- Adjust parallelogram so that vertical lines are vertical or symmetrically about the center vertical axis.

8.6 Unbalance-pin (OSD control)
- Adjust the unbalance-pin so that that vertical border lines are aligned symmetrically.

8.7 Rotation (OSD control)
- Adjust picture so that vertical tilt is less than +/- 0.5mm.

8.8 Store the preset results by selecting the "exit" (OSD control).

8.9 Repeat the procedure 8.1 to 8.8 until all the preset timings have been adjusted completely

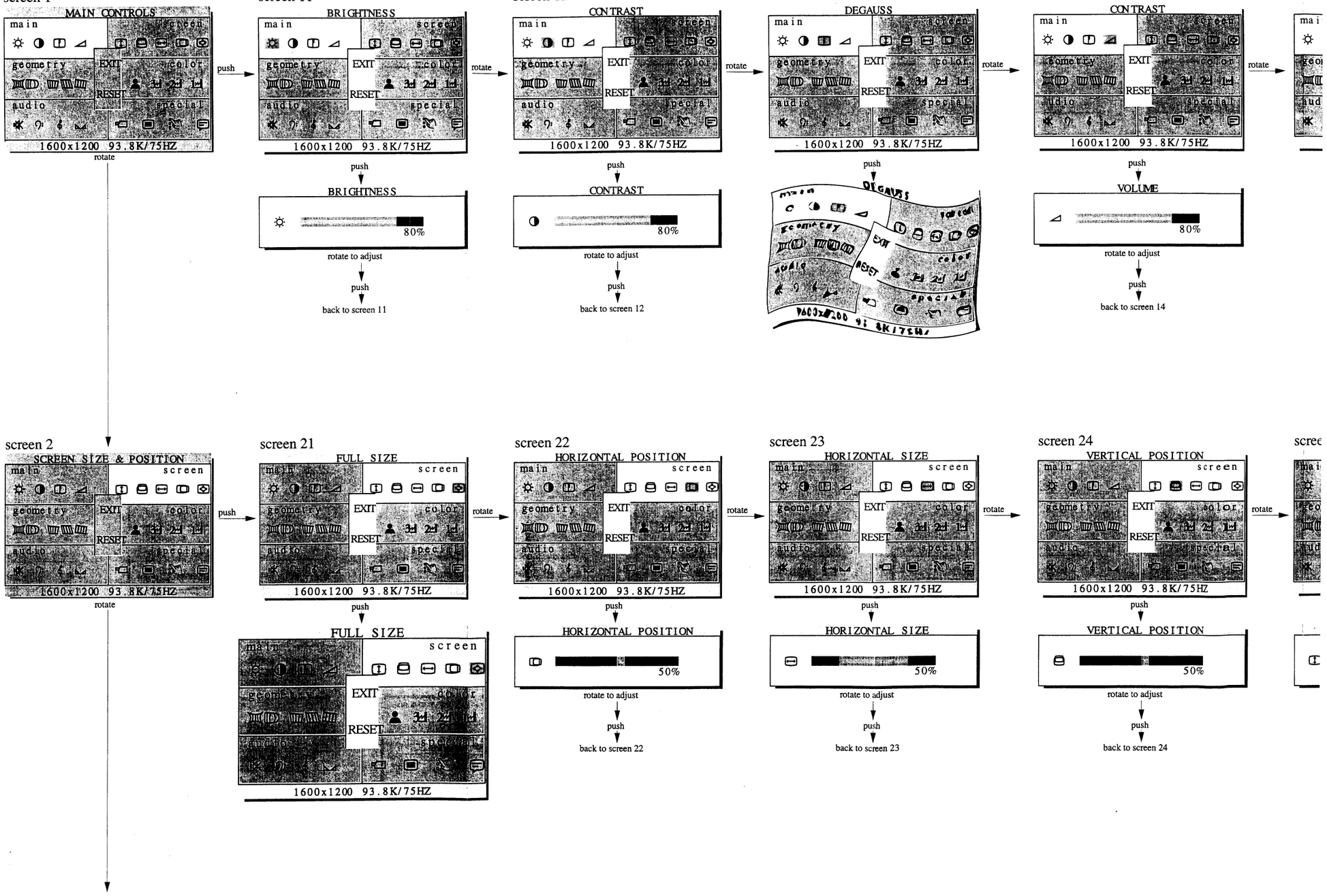
9. Focus adjustment

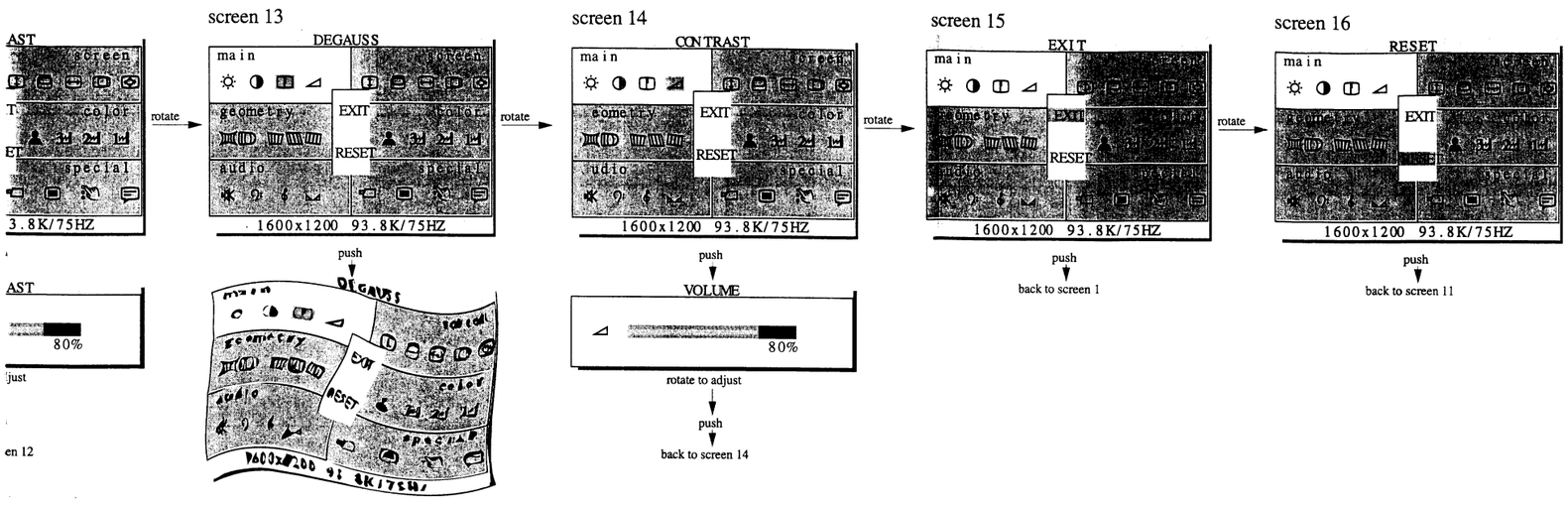
: Apply a video signal in the 1024 x 768 with 69 kHz/85 Hz mode.
: Select "ME" pattern.
: Set the brightness at center (50%) and the contrast at maximum (100%).
: Adjust focus potentiometers (top of L.O.T.) Focus1 for horizontal focus and Focus 2 for vertical focus so that the picture at 2/3 of the diagonal lines (from center to four corners) of the displayed screen is as sharp as possible.

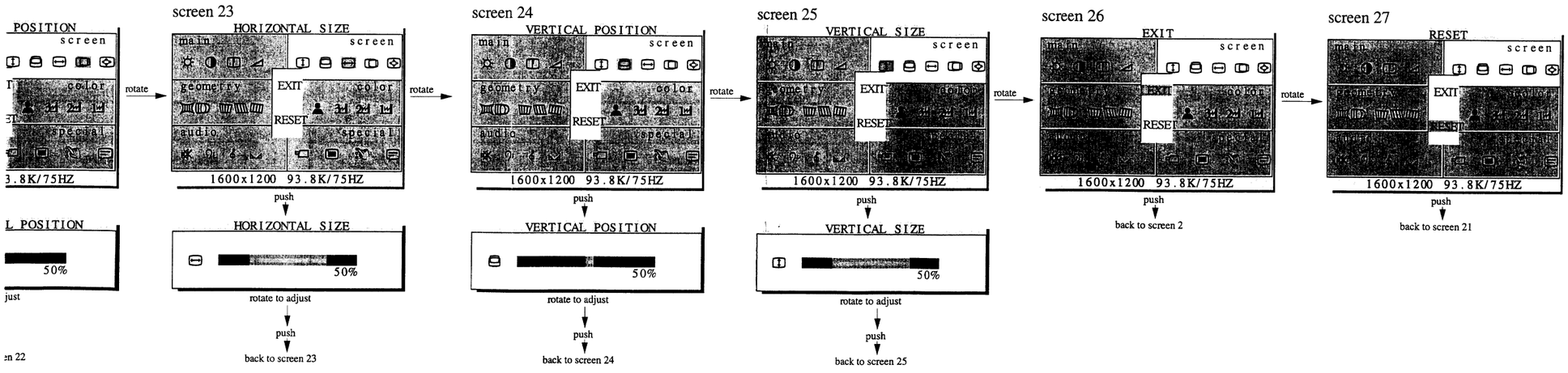
10. Loading DDC code
The DDC HEX data should be written into the DDC IC (7331) by EEPROM writer or equivalent method.

a: Service DDC Kit
DDC Module (DDC cable), Part number = 4822 320 12004
DDCV2N.EXE software (3.5" disk), Part number = 4822 711 00024
b: Please refer to Service information 4822 727 21995 for using the Service DDC Kit.

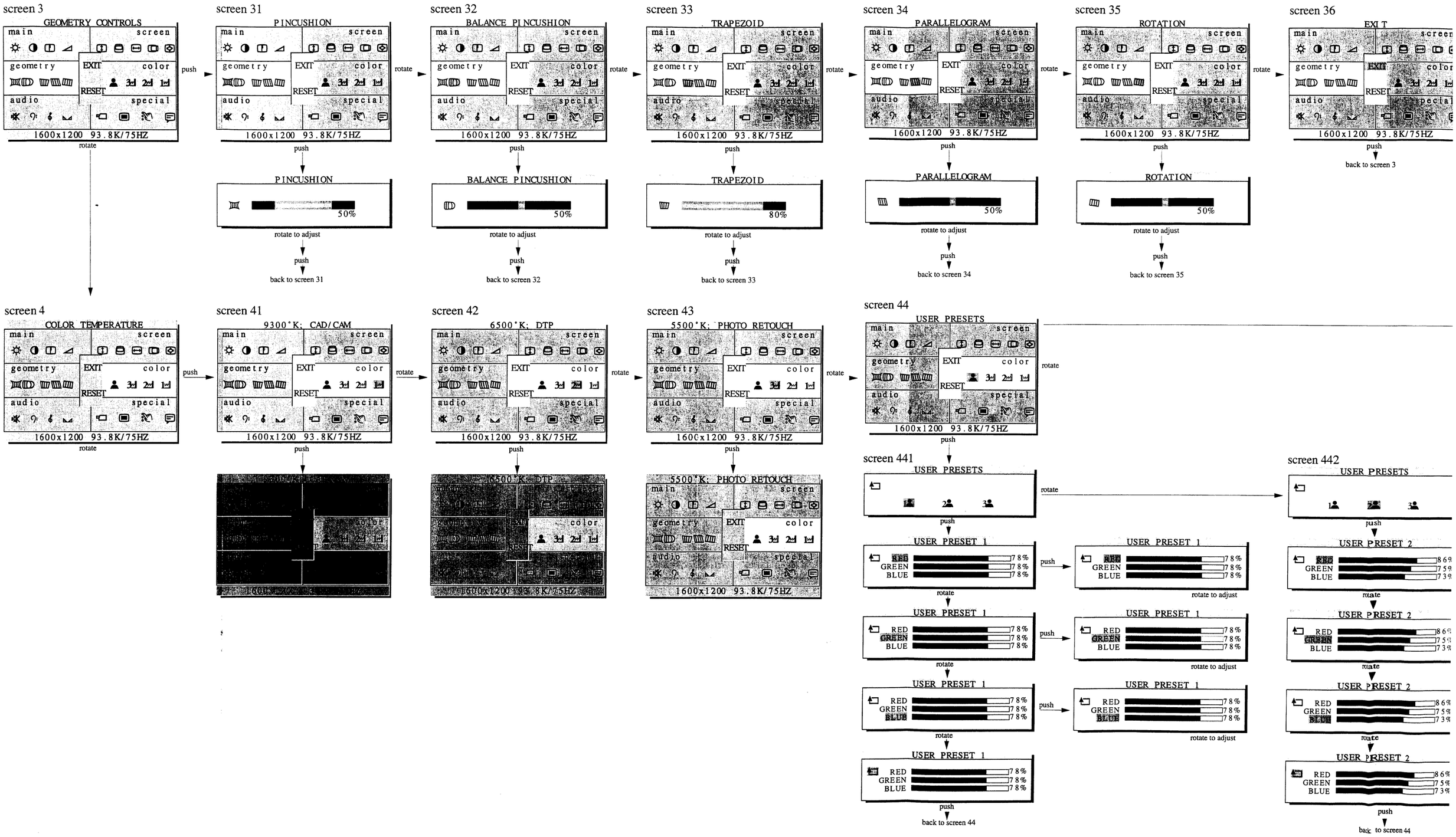
Quick Reference for OSD Adjustment



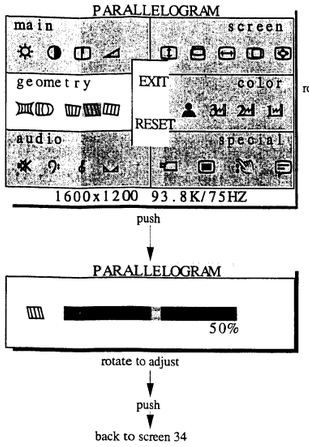

screen 13
screen 14
screen 15
screen 16
DEGAUSS
CONTRAST
EXIT
RESET
main
screen
geometry
color
audio
special
1600x1200 93.8K/75HZ
rotate
push
VOLUME
80%
rotate to adjust
back to screen 14
back to screen 1
back to screen 11
en 12


screen 23
screen 24
screen 25
screen 26
screen 27
HORIZONTAL SIZE
VERTICAL POSITION
VERTICAL SIZE
EXIT
RESET
main
screen
geometry
color
audio
special
1600x1200 93.8K/75HZ
rotate
push
50%
rotate to adjust
back to screen 23
back to screen 24
back to screen 25
back to screen 2
back to screen 21
en 22

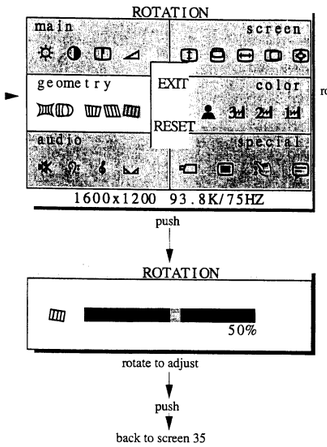
Quick Reference for OSD Adjustment (Continued)



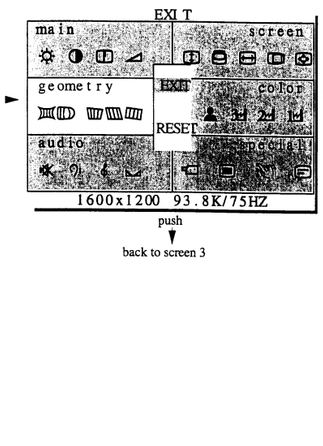
screen 34



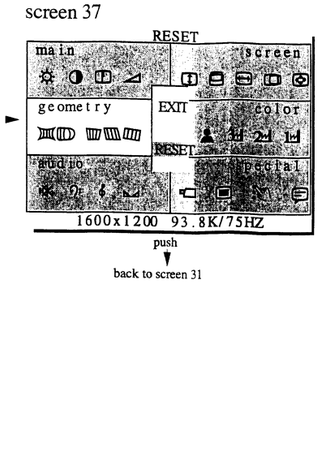
screen 35



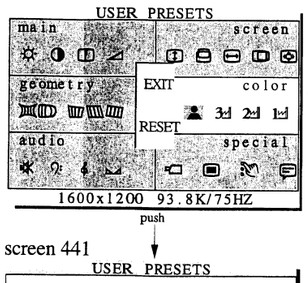
screen 36



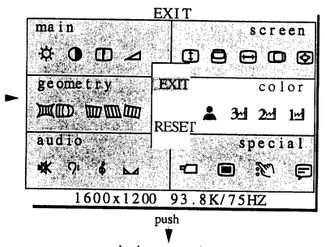
screen 37



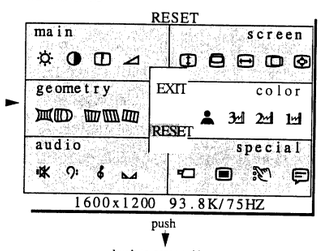
screen 44



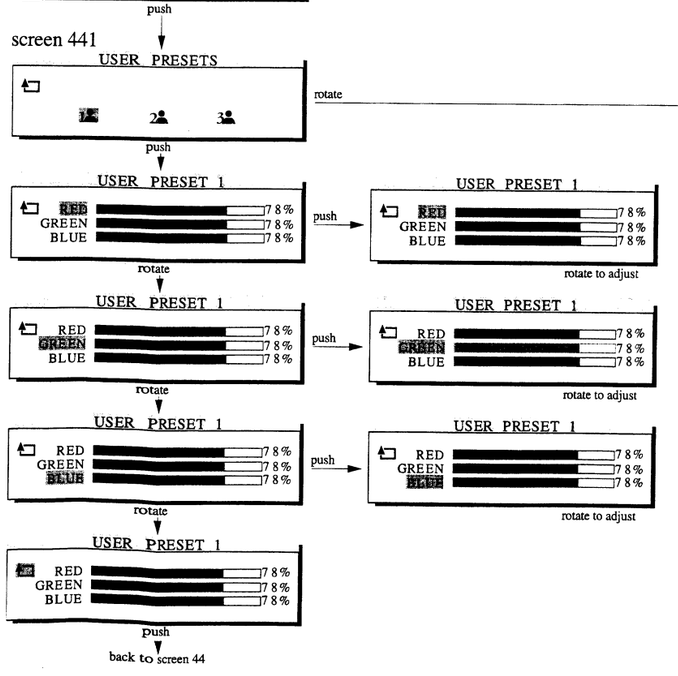
screen 45



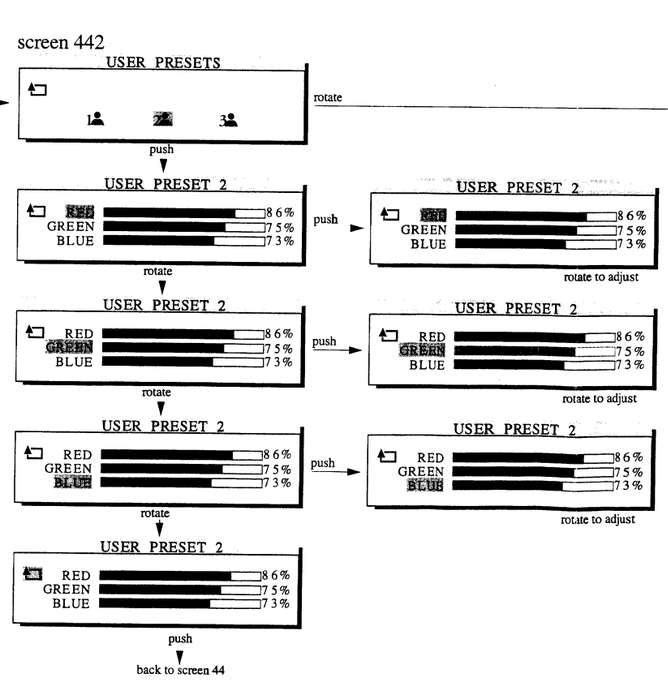
screen 46



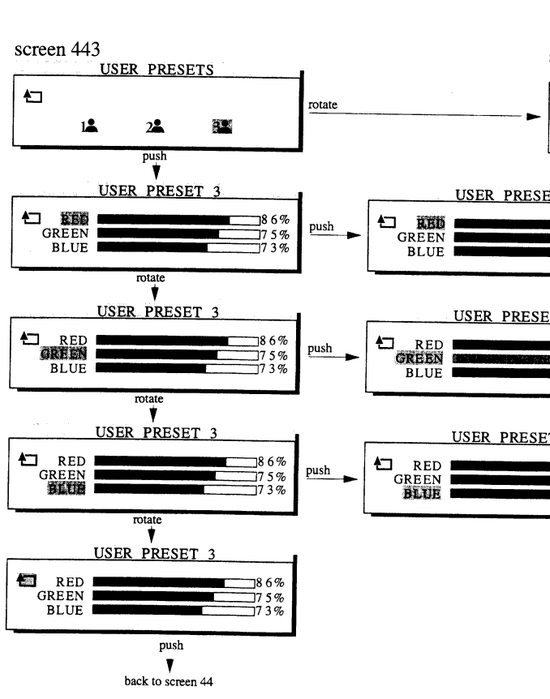
screen 441



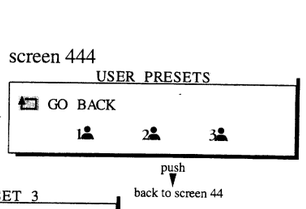
screen 442



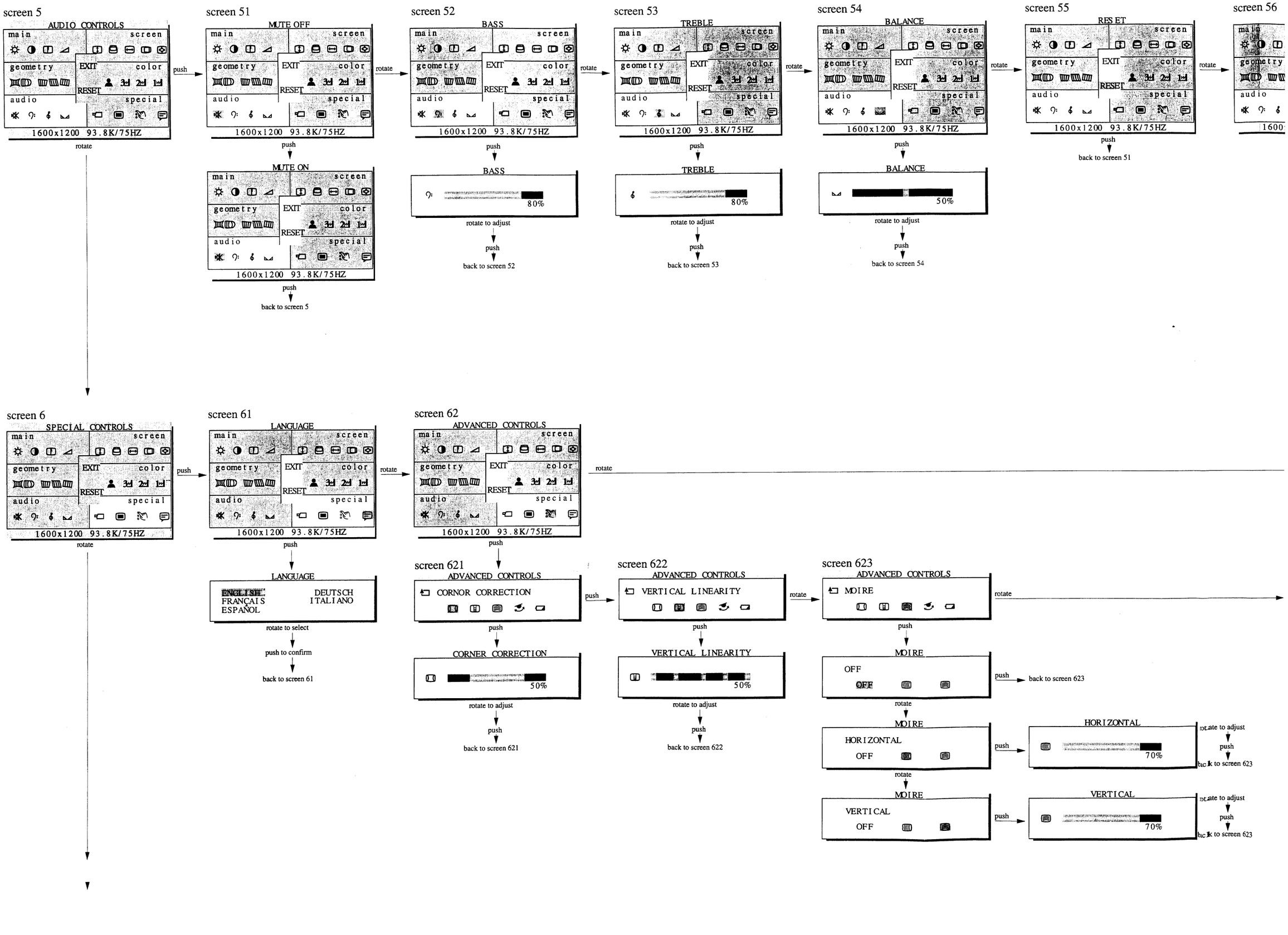
screen 443



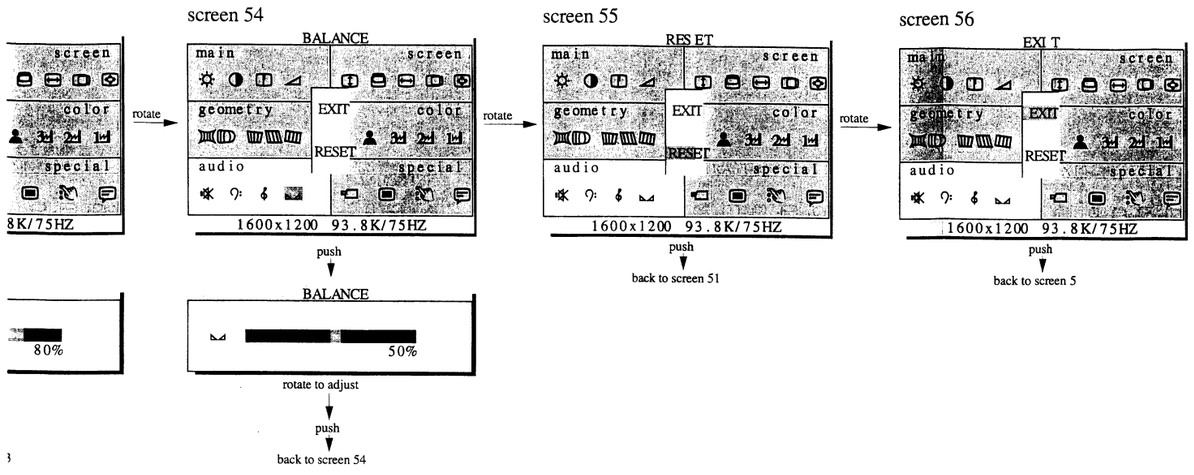
screen 444

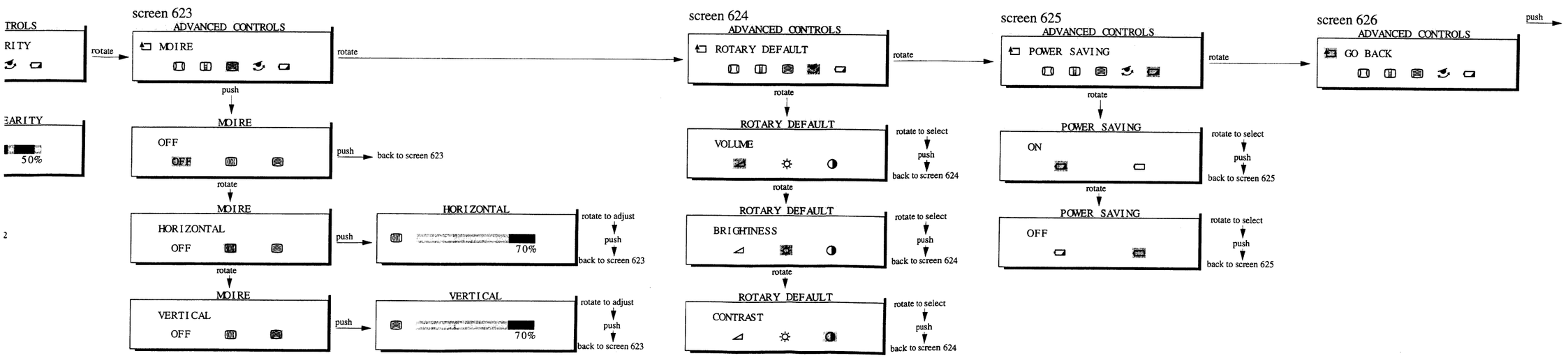


Quick Reference for OSD Adjustment (Continued)

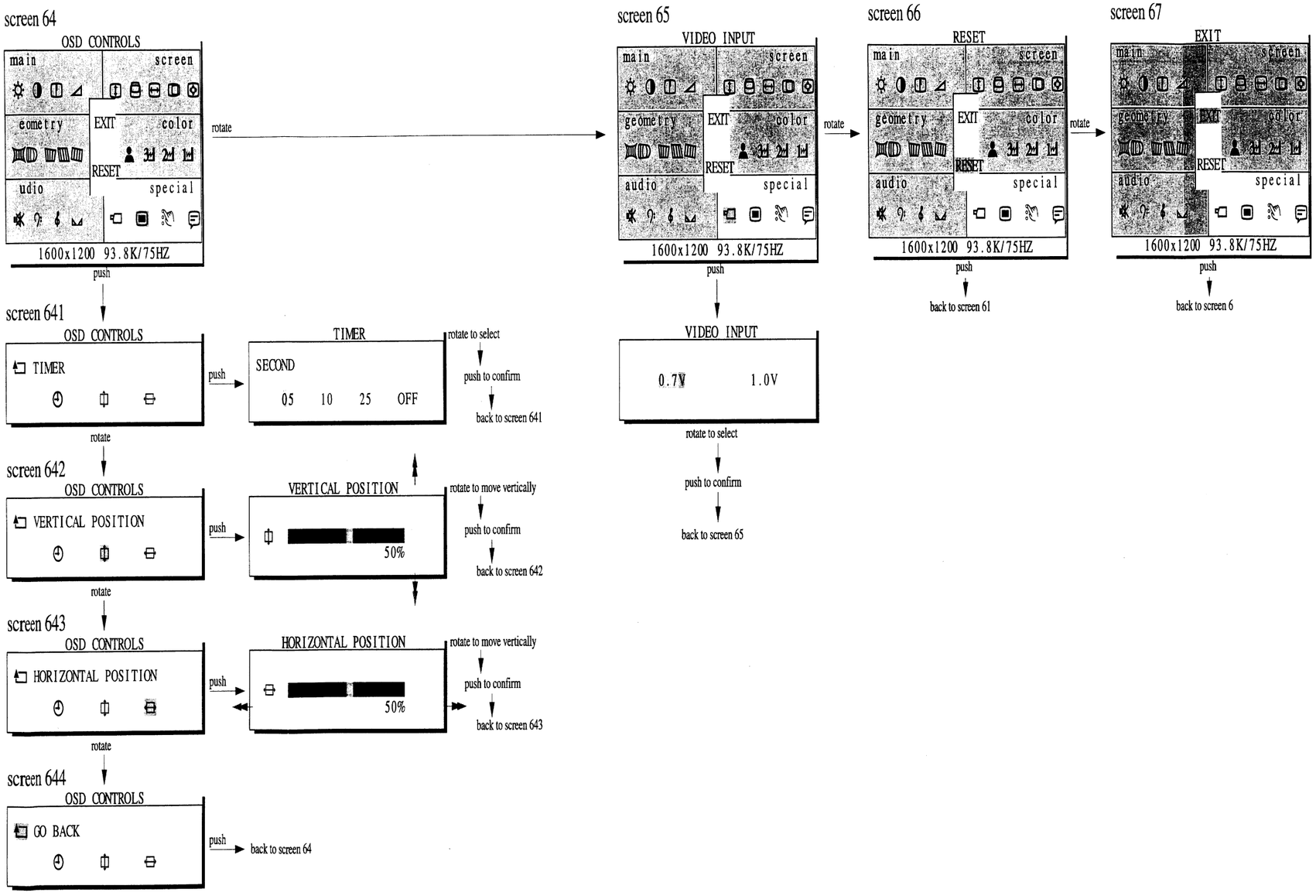


ıued)

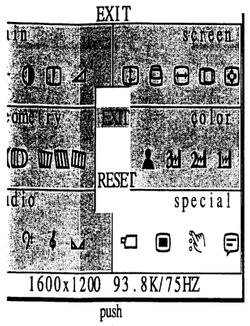

screen 54
screen 55
screen 56
BALANCE
RESET
EXIT
main
screen
geometry
color
audio
special
rotate
1600x1200 93.8K/75HZ
push
back to screen 51
back to screen 5
80%
50%
rotate to adjust
back to screen 54


screen 623
screen 624
screen 625
screen 626
ADVANCED CONTROLS
MOIRE
ROTARY DEFAULT
POWER SAVING
GO BACK
OFF
HORIZONTAL
VERTICAL
VOLUME
BRIGHTNESS
CONTRAST
ON
70%
rotate
push
rotate to select
rotate to adjust
back to screen 623
back to screen 624
back to screen 625

Quick Reference for OSD Adjustment (Continued)



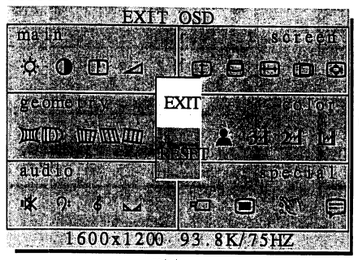
een 67



push

back to screen 6

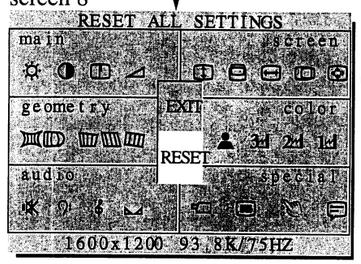
screen 7



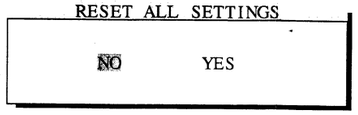
push → exit OSD

rotate

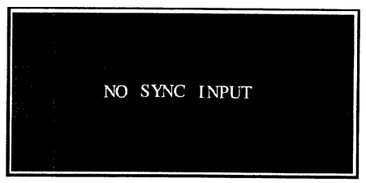
screen 8



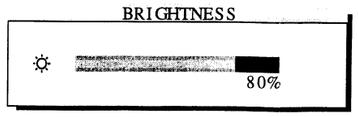
push →

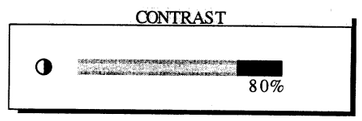


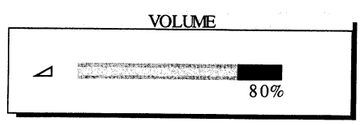
push → back to screen 1



"When rotary default setting selected"







Mechanical Adjustments

0. Location of the panel
0.1 Main panel (1156)
0.2 Video panel (1157)
0.3 Earphone panel (1158)
0.4 Terminal panel (1159)
0.5 USB panel (1160) - optional
0.6 Encoder panel (1162)
0.7 Power switch panel (1163)

1. General
To be able to perform measurements and repairs on the circuit boards, the monitor should placed in **Service Position (Fig. 3.1)** first:

How to remove the back cover of monitor :

There are 4 screws [2 screws are at the rear of the monitor, the other two screws are on the bottom of the monitor] to fix the front cabinet and back cover of the monitor.

Step 1: Remove the "cable cover" as shown in Fig. 3.2.
Step 2: Remove 2 screws (rear view) as shown in Fig. 3.3.
Step 3: Turn the set to remove the other 2 screws, as shown in Fig. 3.4 .
Step 4: Turn the set to its original position.
Step 5: Remove back cover (* There are two "plastic clips" on the "front cabinet" to hold the "rear cover" as shown in Fig. 3.5).

Chassis :

After removing the back cover, you can see the inside the monitor with metal frame and metal shield.
- Remove 26 screws for service position as Fig. 3.6 to Fig. 3.15.

Video panel :
- After removing the metal frames, remove the metal shielding on rear side of Video panel for measurement.

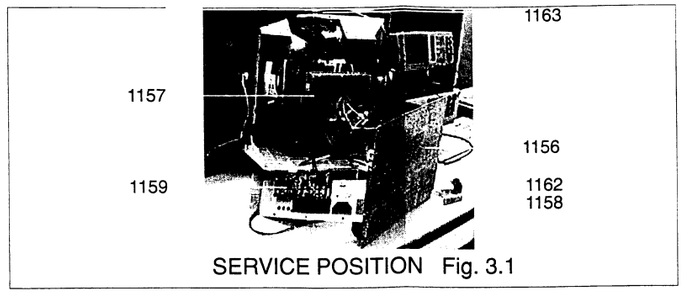
Main panel :

After removing the metal frames,
- Disconnect "Video panel"
- Disconnect EHT cable (EHT cap)
- Disconnect 4 pin connector "M1501" (wire of YOKE, on Main panel)
- Disconnect 2 pin connector "M1114" (degaussing coil, on Main panel)
- Disconnect 1 pin connector "M1701" (on Video panel)
- Disconnect 2 pin connector "M1219" (on Main panel)
- Disconnect 9 pin connector "M1217" (on Main panel)
- Disconnect 3 pin connector "M1213" (on Main panel)
- Disconnect 3 pin connector "M1504" (on Main panel)
- Disconnect 2 pin connector "M1218" (on Main panel)
- Disconnect 2 pin connector "M1220" (on Main panel)
- Disconnect 7 pin connector "M1212" (on Main panel)

- To slide out Main panel.
- Remove 2 screws as shown in Fig. 3.14, then push the clips to the right as shown in Fig. 3.13, to separate the bottom plate.
- Remove the plastic frame as shown in Fig. 3.15.
- Remove the "Rotary panel" "Earphone panel" from Front cabinet and place it on the table as shown in Fig.3.1.
- Connect all the connectors and panels for service position.

Service position :
Place monitor in service position as shown in Fig. 3.1 through Fig. 3.15.

2. Repair instructions
After the service position is obtained, all the panel's copper trace sides may be accessed.



SERVICE POSITION Fig. 3.1

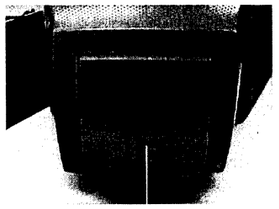
Fig. 3.2

cable cover

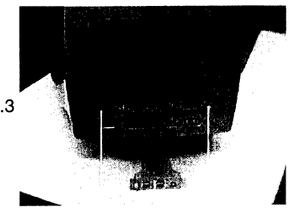
Fig. 3.3

screw usb module screw
screw

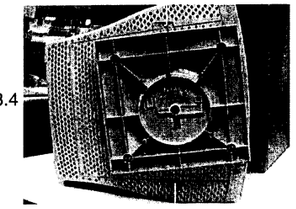
Fig. 3.4

screw
screws

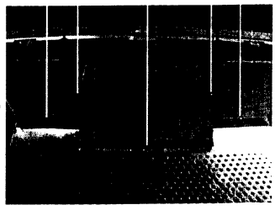
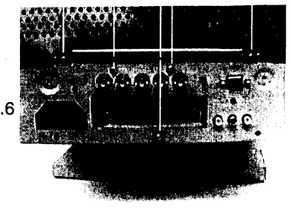
Fig. 3.5

screws

Fig. 3.6


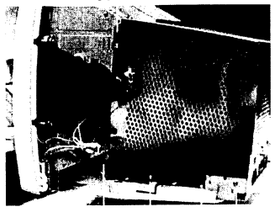
screw
Fig. 3.7

screws

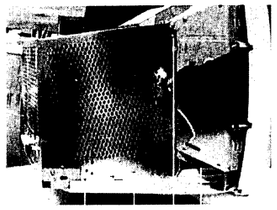
Fig. 3.8

screws

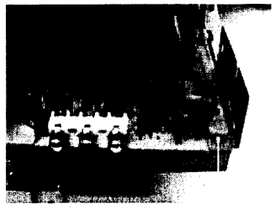
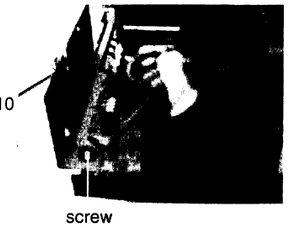
Fig. 3.9

screw

Fig. 3.10

screw

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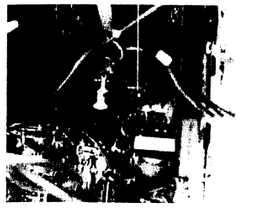

screw

Fig. 3.12

screw

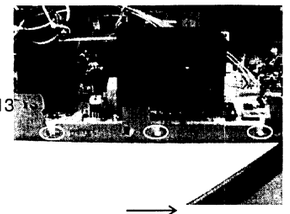
Fig. 3.13

push

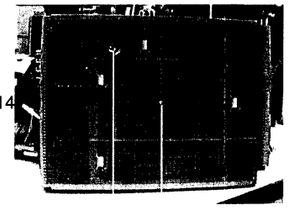
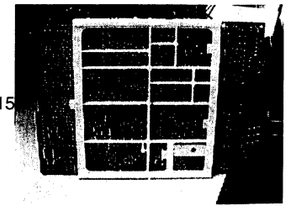
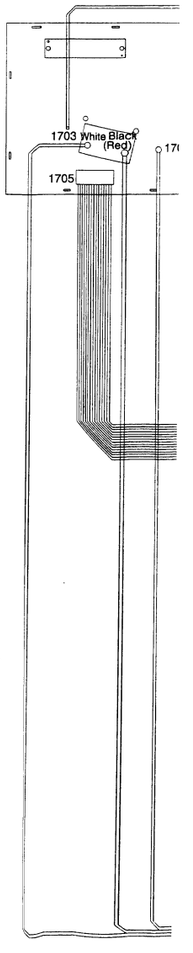
Fig. 3.14

screws

Fig. 3.15

push the plastic frame, then remove it



Wiring diagram

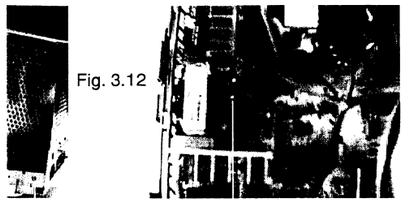


Fig. 3.12

screw

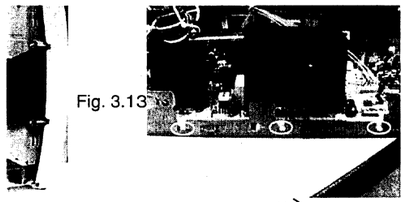


Fig. 3.13

push

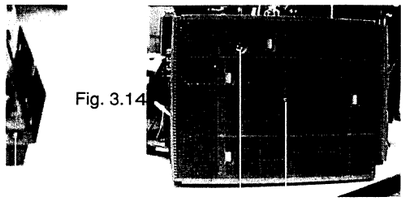


Fig. 3.14

screw

screws

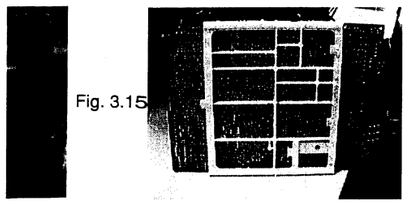
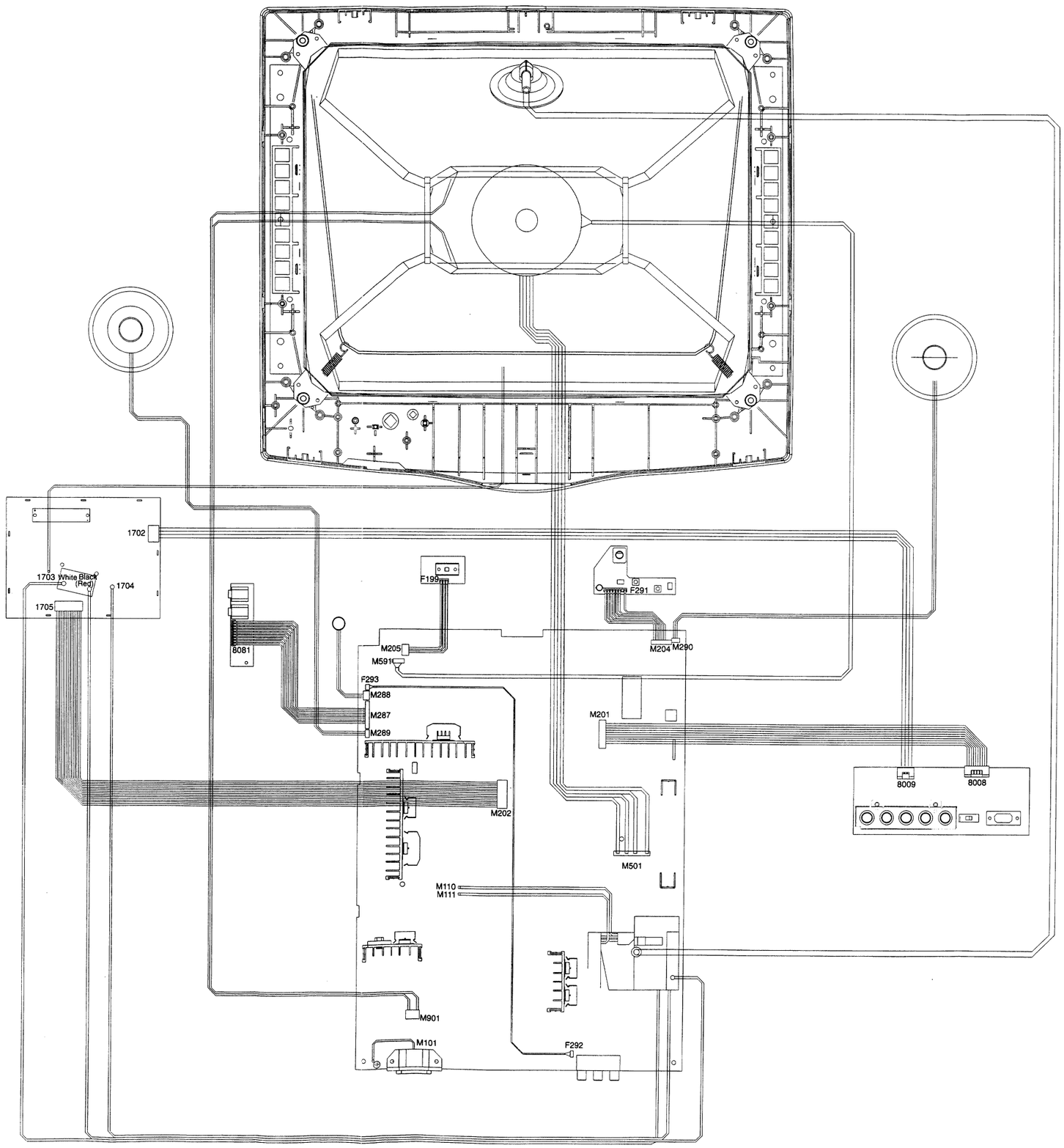
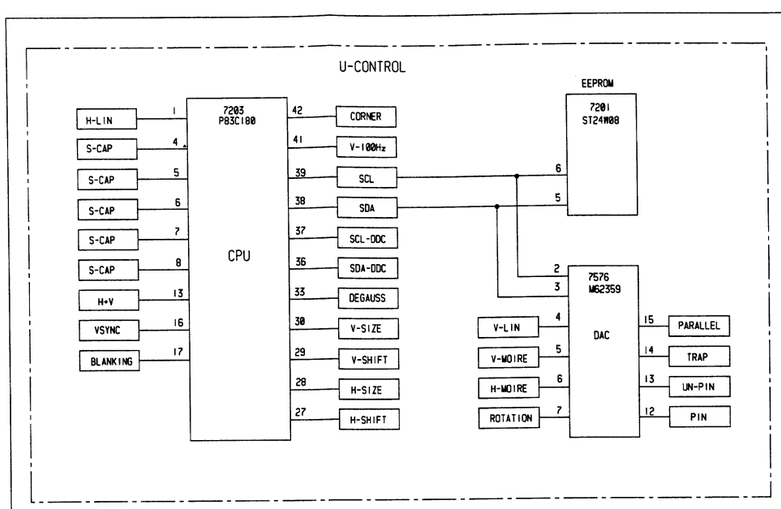


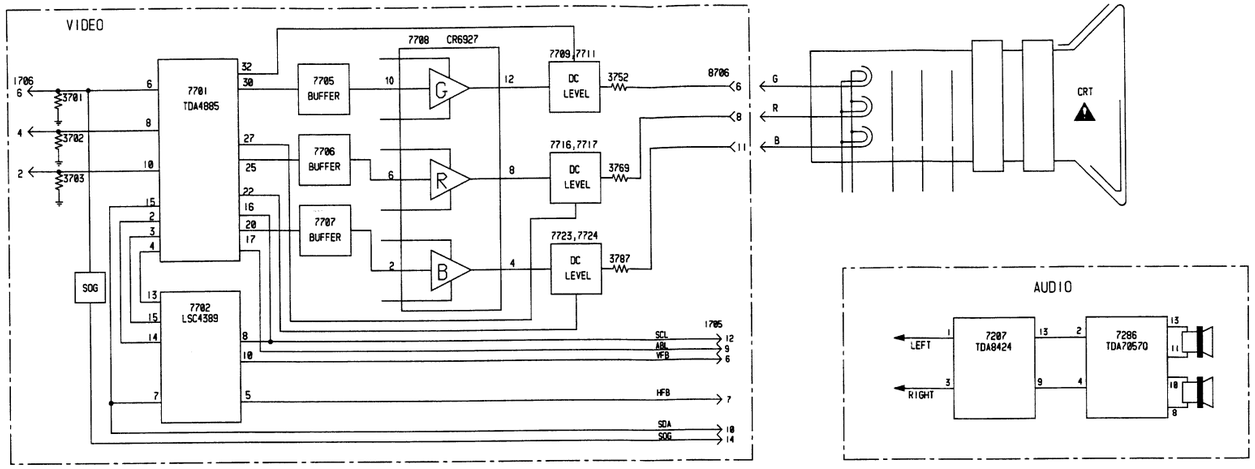
Fig. 3.15

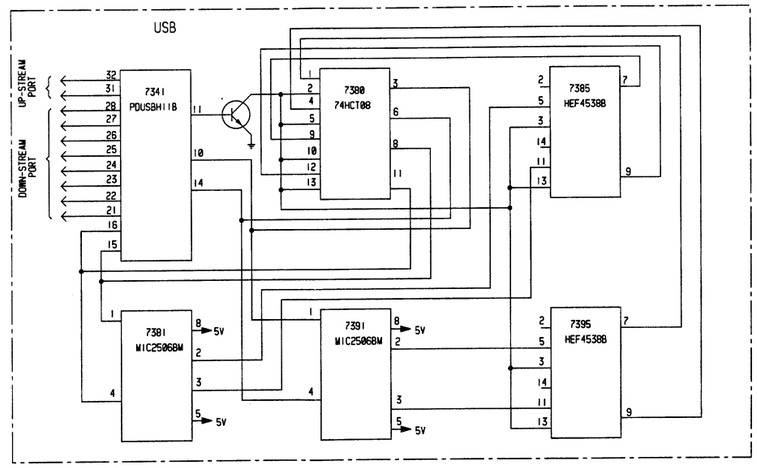
push the plastic frame, then remove it

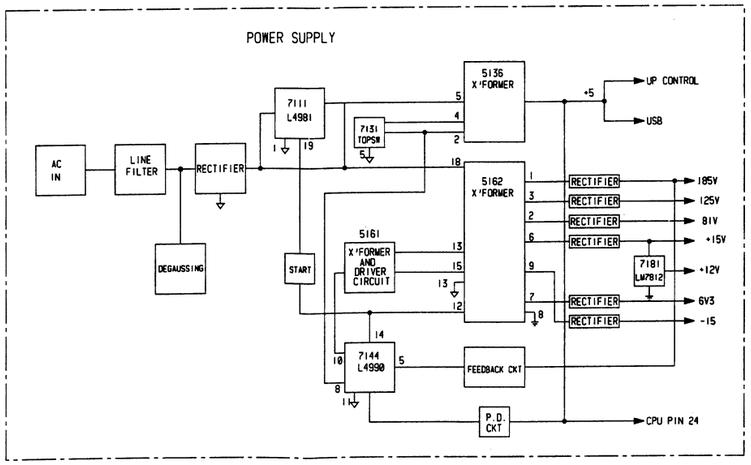


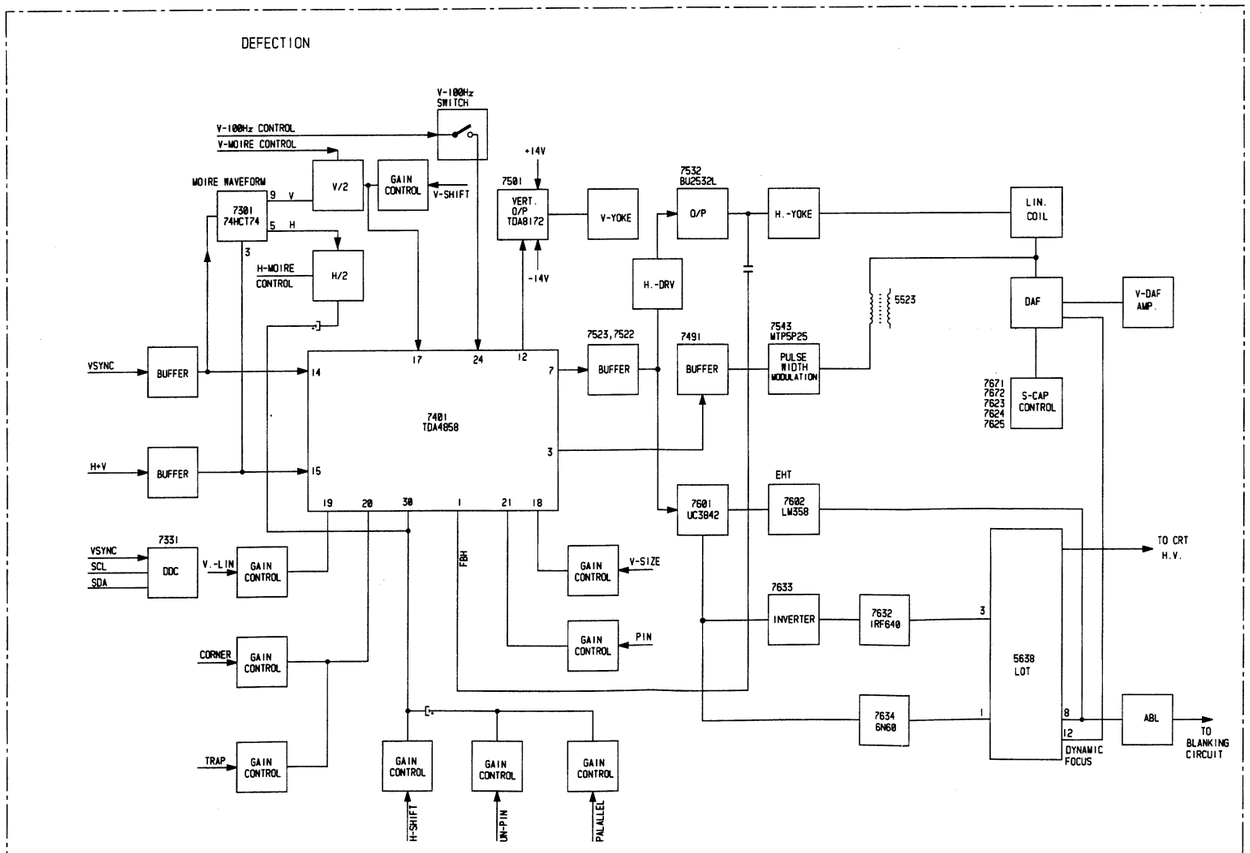
Block Diagram











Video Panel C.B.A. (A)

6703 B 3	3797 D 6	3749 C 2	2793 C 1	2743 B 2	1701 C 3
6704 D 2	3798 D 6	3750 D 2	3701 B 7	2744 B 3	1702 B 7
6705 B 3	3799 D 6	3751 C 2	3702 B 7	2745 A 2	1703 D 3
6706 D 1	3800 D 1	3752 D 5	3703 B 7	2746 A 1	1704 D 5
6708 D 5	3801 D 6	3753 C 2	3705 D 7	2747 E 2	1705 E 3
6709 D 2	3802 D 6	3754 B 5	3706 D 7	2748 A 7	1706 C 4
6711 B 5	3803 D 7	3755 A 5	3708 D 7	2749 C 6	2701 B 7
6712 C 5	3804 E 6	3756 A 3	3709 D 7	2751 C 6	2702 B 7
6713 C 6	3806 C 2	3757 A 3	3710 B 6	2752 C 6	2703 B 7
6714 B 5	3807 B 2	3758 A 3	3711 D 7	2753 C 6	2704 B 6
6715 C 6	3808 B 1	3759 A 5	3712 B 6	2754 D 6	2705 C 7
6721 B 5	3810 D 6	3760 B 5	3713 B 6	2755 C 7	2706 D 7
6724 B 5	3811 D 5	3761 A 3	3714 B 6	2756 E 6	2707 B 6
6731 A 5	3812 C 5	3762 B 3	3715 C 7	2757 D 1	2708 B 6
6734 A 5	3813 D 7	3763 B 3	3716 B 7	2758 C 6	2709 A 6
7701 C 7	3814 B 4	3764 D 1	3717 C 7	2759 D 6	2711 A 6
7702 C 6	3815 B 3	3765 B 3	3718 C 7	2760 E 4	2712 B 5
7703 D 7	3816 C 2	3766 B 3	3719 D 7	2761 E 4	2713 B 5
7704 E 7	3817 B 7	3767 C 2	3720 B 6	2762 E 4	2714 A 5
7705 B 5	3818 A 1	3768 D 2	3721 B 7	2763 E 3	2715 B 6
7706 B 5	3819 B 5	3769 C 4	3722 B 7	2764 E 3	2716 B 5
7707 A 5	3820 B 5	3770 C 2	3723 B 7	2765 E 3	2717 A 4
7708 A 2	3821 A 5	3771 B 2	3724 A 7	2766 E 3	2718 A 4
7709 C 2	3822 A 5	3772 A 5	3725 A 7	2767 E 4	2719 A 4
7711 C 2	3823 A 5	3773 A 5	3726 A 7	2768 E 2	2720 B 2
7716 B 2	3824 A 5	3774 A 3	3727 B 6	2769 E 3	2721 B 4
7717 C 2	3825 B 5	3775 A 2	3728 A 6	2770 E 3	2722 B 3
7723 B 1	3826 A 5	3776 A 2	3729 B 6	2771 E 3	2723 B 4
7724 C 1	3827 A 5	3777 A 5	3730 B 6	2772 C 3	2724 A 5
7725 E 6	3828 E 6	3778 A 2	3731 A 6	2773 D 5	2725 B 5
7726 E 1	3829 C 5	3779 B 2	3732 A 6	2774 C 5	2726 B 5
7727 A 1	3831 C 6	3780 B 2	3733 A 6	2776 E 4	2727 A 3
	3832 C 6	3781 B 3	3734 A 6	2777 D 5	2728 A 3
	5702 C 7	3782 B 1	3735 A 6	2778 D 2	2729 A 3
	5703 D 6	3784 B 2	3736 B 5	2779 C 4	2730 B 3
	5704 E 2	3785 C 1	3737 B 5	2780 C 3	2731 B 3
	5705 E 2	3786 D 1	3738 A 4	2781 D 1	2732 B 3
	5706 B 4	3787 C 3	3739 A 4	2782 E 1	2733 D 2
	5707 B 4	3788 C 1	3740 B 5	2783 E 2	2734 A 5
	5708 C 3	3789 C 1	3741 A 3	2784 C 2	2735 A 5
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	5710 B 1	3791 E 6	3743 A 3	2786 C 1	2737 B 7
	5711 A 5	3792 E 6	3744 B 4	2787 A 4	2738 A 3
	5712 B 1	3793 D 6	3745 B 4	2788 A 3	2739 A 2
	5713 E 6	3794 C 6	3746 D 2	2789 A 2	2740 A 2
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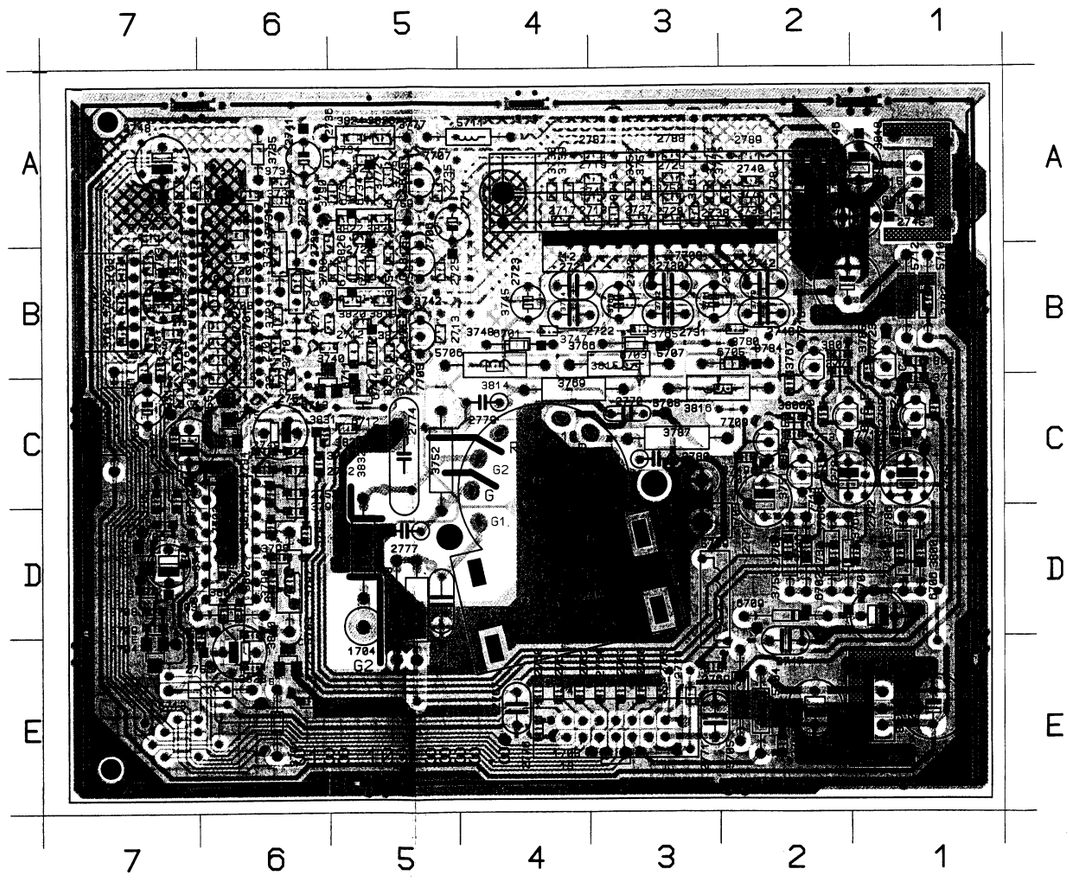
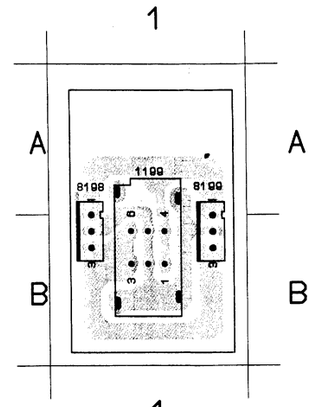


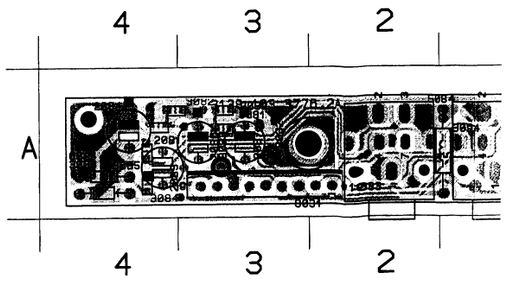
Power Switch Panel C.B.A

1199 B 1
8198 B 1
8199 B 1

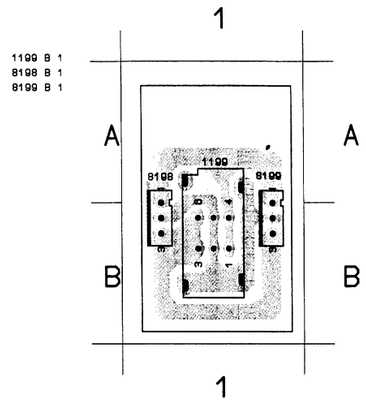


Earphone Panel C.B.A. (F

8033 A 3	5084 A 1	3085 A 4	3081 A 3	2084 A 4	
	6084 A 4	3093 A 1	3082 A 3	2085 A 4	
	8031 A 2	3094 A 1	3083 A 4	2086 A 3	
	8032 A 3	5083 A 1	3084 A 4	2087 A 3	

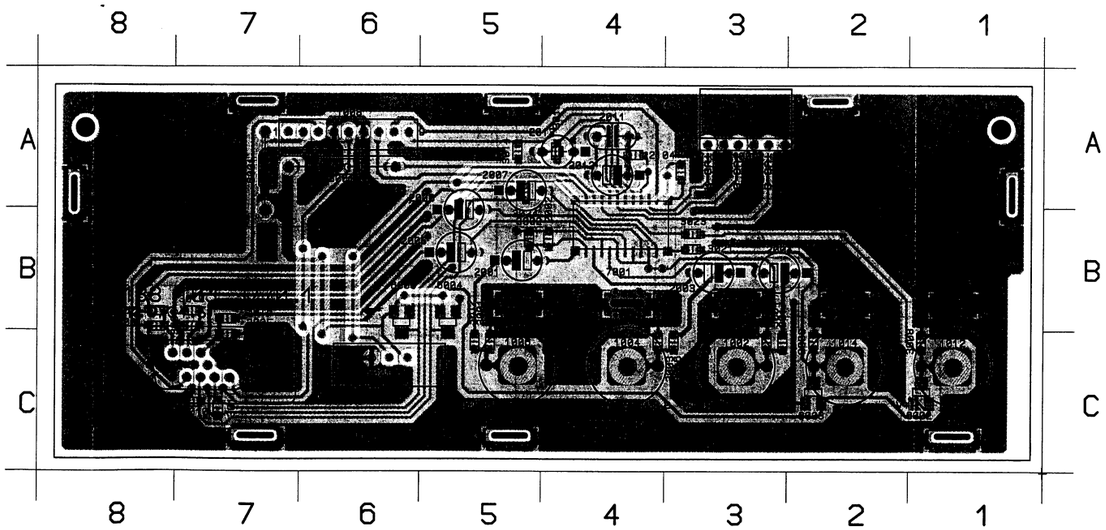


Power Switch Panel C.B.A. (G)



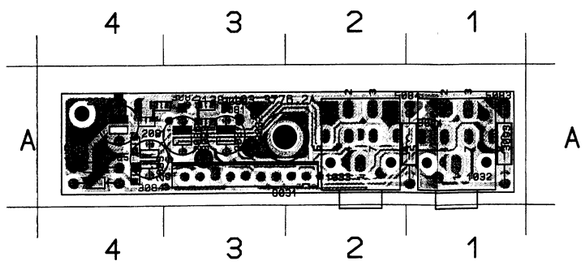
Terminal Panel C.B.A. (A1)

6005 B 6 6001 A 7 3022 A 3 3018 B 7 3013 A 4 3009 C 2 3005 C 7 3001 C 5 2011 A 4 2004 B 3 1014 C 2 1008 A 7 1001 C 6
7001 B 4 6002 C 1 3023 B 3 3019 B 7 3014 A 5 3010 C 7 3006 B 7 3002 B 5 2012 A 4 2005 B 5 2001 B 5 1009 A 3 1002 C 3
6003 C 2 3024 A 5 3020 B 8 3016 C 3 3011 C 7 3007 B 8 3003 C 4 2013 A 5 2006 B 5 2002 B 4 1010 C 8 1004 C 4
6004 B 5 5001 A 6 3021 B 3 3017 C 3 3012 C 5 3008 C 1 3004 C 3 2104 A 4 2007 A 5 2003 B 3 1012 C 1 1006 C 5



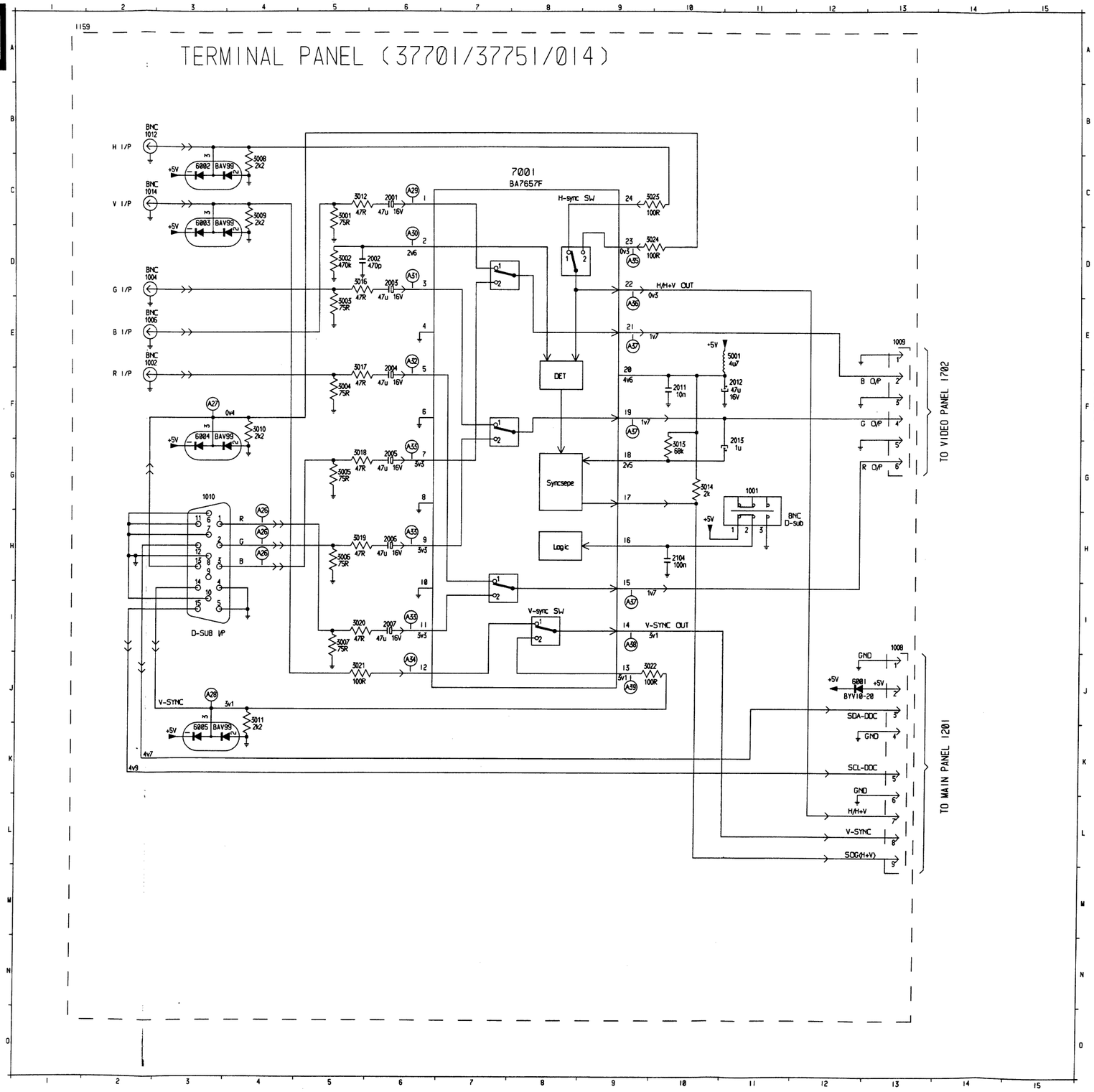
Earphone Panel C.B.A. (F)

8033 A 3 5004 A 1 3005 A 4 3001 A 3 2004 A 4 1032 A 1
5004 A 4 3003 A 1 3002 A 3 2005 A 4 1033 A 2
8031 A 2 3004 A 1 3003 A 4 2006 A 3 2001 A 4
8032 A 3 5003 A 1 3004 A 4 2007 A 3 2002 A 3

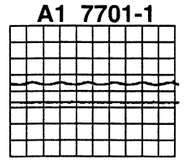


Terminal Schematic Diagram

A1

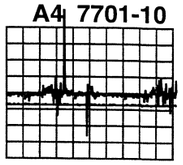


A1 7701-1



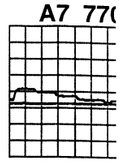
1 V/div AC
10 mS/div

A4 7701-10



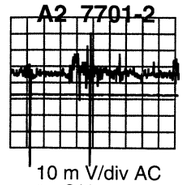
2 V/div AC
5 uS/div

A7 77(



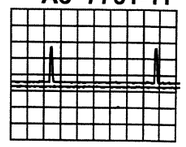
5 V/div A
5 uS/div

A2 7701-2



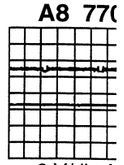
10 m V/div AC
5 uS/div

A5 7701-11



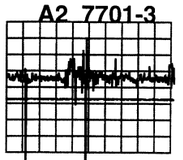
5 V/div AC
5 uS/div

A8 77(



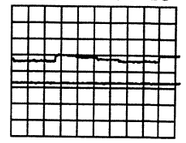
2 V/div A
5 mS/div

A2 7701-3



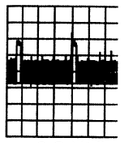
10 mV/div AC
5 uS/div

A6 7701-20



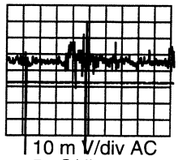
5 V/div AC
5 uS/div

A9 77(



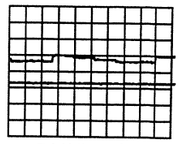
0.2 V/div
5 mS/div

A2 7701-4



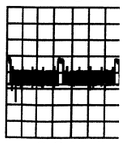
10 m V/div AC
5 uS/div

A6 7701-25



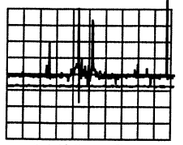
5 V/div AC
5 uS/div

A10 77



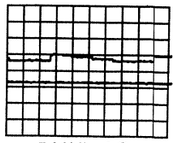
0.2 V/div
5 mS/div

A3 7701-5



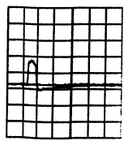
2 V/div AC
5 uS/div

A6 7701-30



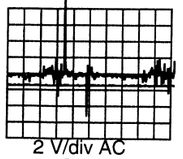
5 V/div AC
5 uS/div

A11 77



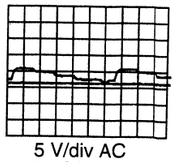
0.5 V/div
5 uS/div

A4 7701-6



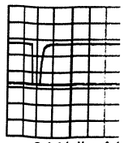
2 V/div AC
5 uS/div

A7 7701-21



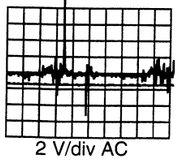
5 V/div AC
5 uS/div

A12 77



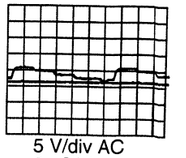
2 V/div AC
5 uS/div

A4 7701-8



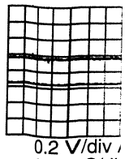
2 V/div AC
5 uS/div

A7 7701-26



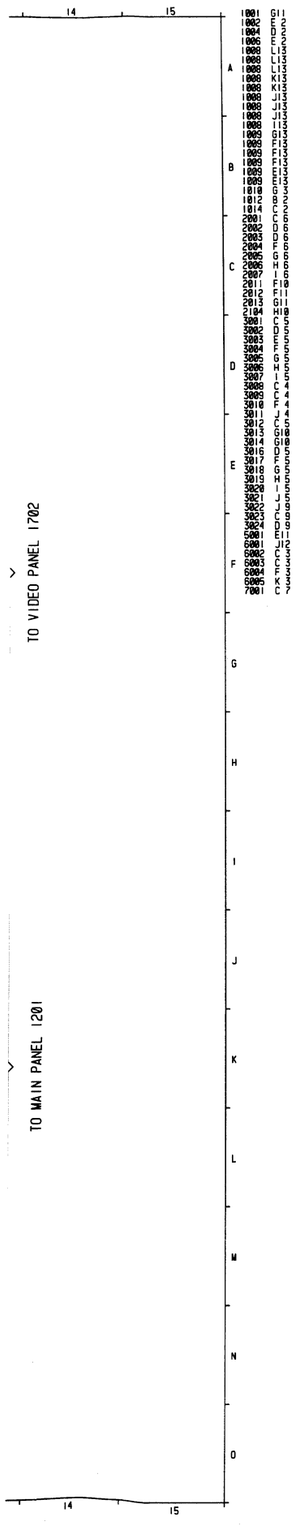
5 V/div AC
5 uS/div

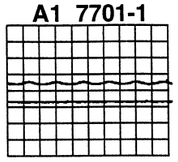
A13 77

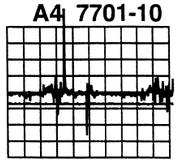


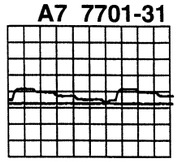
0.2 V/div
0.1 mS/di

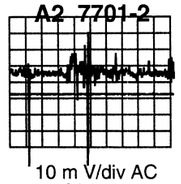
Waveforms for Diagram A1 and A2



A1 7701-1

1 V/div AC
10 mS/div

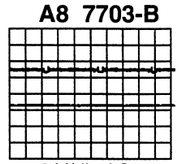
A4 7701-10

2 V/div AC
5 uS/div

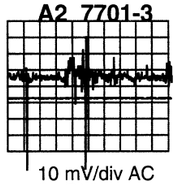
A7 7701-31

5 V/div AC
5 uS/div

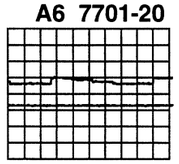
A2 7701-2

10 m V/div AC
5 uS/div

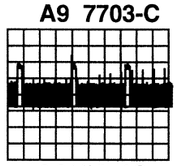
A5 7701-11

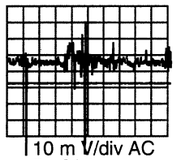
5 V/div AC
5 uS/div

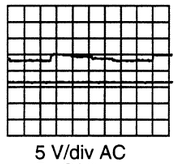
A8 7703-B

2 V/div AC
5 mS/div

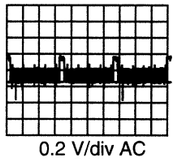
A2 7701-3

10 mV/div AC
5 uS/div

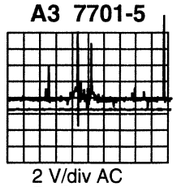
A6 7701-20

5 V/div AC
5 uS/div

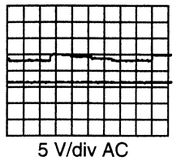
A9 7703-C

0.2 V/div AC
5 mS/div

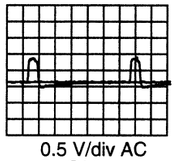
A2 7701-4

10 m V/div AC
5 uS/div

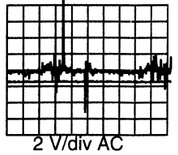
A6 7701-25

5 V/div AC
5 uS/div

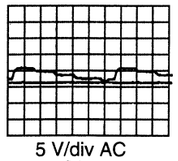
A10 7704-B

0.2 V/div AC
5 mS/div

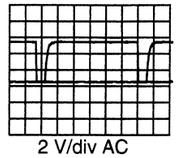
A3 7701-5

2 V/div AC
5 uS/div

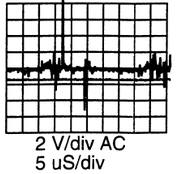
A6 7701-30

5 V/div AC
5 uS/div

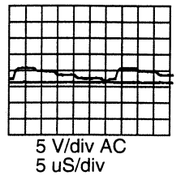
A11 7725-B

0.5 V/div AC
5 uS/div

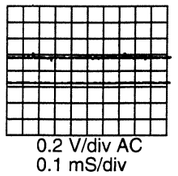
A4 7701-6

2 V/div AC
5 uS/div

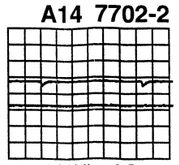
A7 7701-21

5 V/div AC
5 uS/div

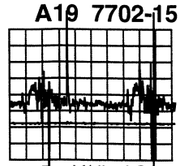
A12 7725-C

2 V/div AC
5 uS/div

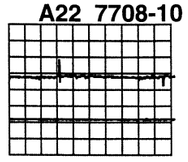
A4 7701-8

2 V/div AC
5 uS/div

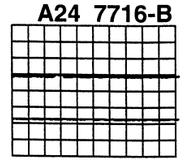
A7 7701-26

5 V/div AC
5 uS/div

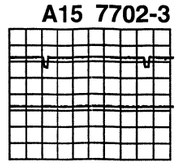
A13 7702-1

0.2 V/div AC
0.1 mS/div

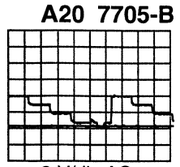
A14 7702-2

1 V/div AC
5 uS/div

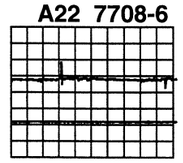
A19 7702-15

5 mV/div AC
5 uS/div

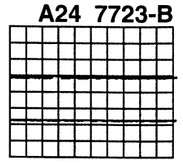
A22 7708-10

0.5 V/div AC
5 uS/div

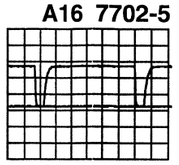
A24 7716-B

20 V/div AC
0.5 mS/div

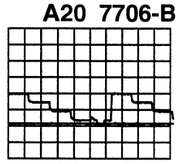
A15 7702-3

0.5 V/div AC
5 uS/div

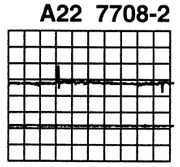
A20 7705-B

2 V/div AC
5 uS/div

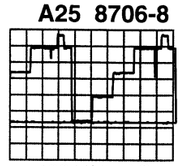
A22 7708-6

0.5 V/div AC
5 uS/div

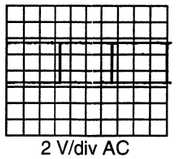
A24 7723-B

20 V/div AC
0.5 mS/div

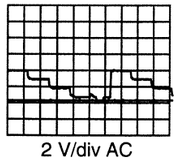
A16 7702-5

2V/div AC
5 uS/div

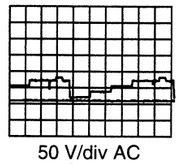
A20 7706-B

2 V/div AC
5 uS/div

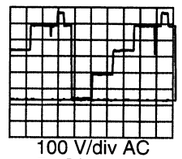
A22 7708-2

0.5 V/div AC
5 uS/div

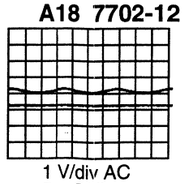
A25 8706-8

100 V/div AC
5 uS/div

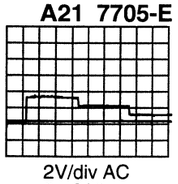
A17 7702-10

2 V/div AC
5 uS/div

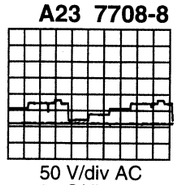
A20 7707-B

2 V/div AC
5 uS/div

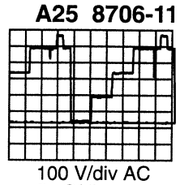
A23 7708-12

50 V/div AC
5 uS/div

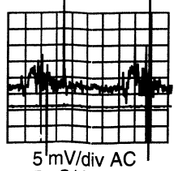
A25 8706-6

100 V/div AC
5 uS/div

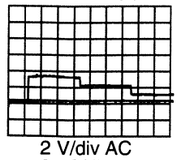
A18 7702-12

1 V/div AC
5 mS/div

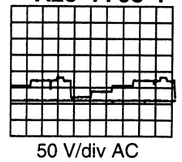
A21 7705-E

2V/div AC
2 uS/div

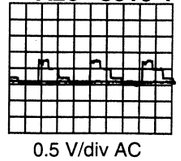
A23 7708-8

50 V/div AC
5 uS/div

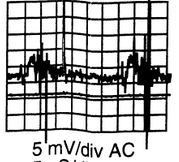
A25 8706-11

100 V/div AC
5 uS/div

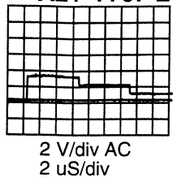
A19 7702-13

5 mV/div AC
5 uS/div

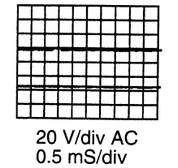
A21 7706-E

2 V/div AC
2 uS/div

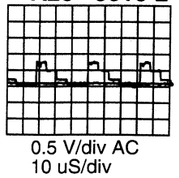
A23 7708-4

50 V/div AC
5 uS/div

A26 8010-1

0.5 V/div AC
10 uS/div

A19 7702-14

5 mV/div AC
5 uS/div

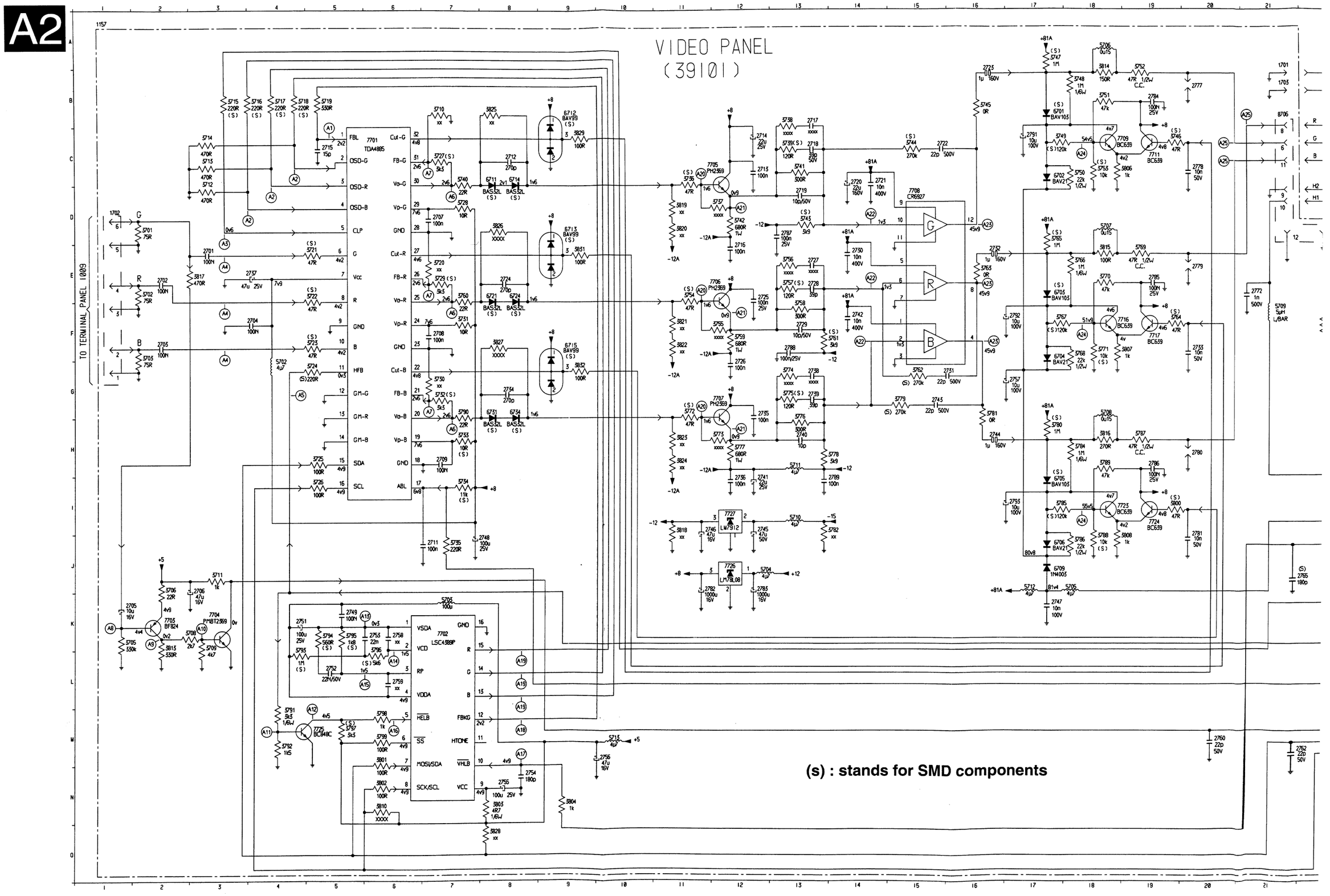
A21 7707-E

2 V/div AC
2 uS/div

A24 7709-B

20 V/div AC
0.5 mS/div

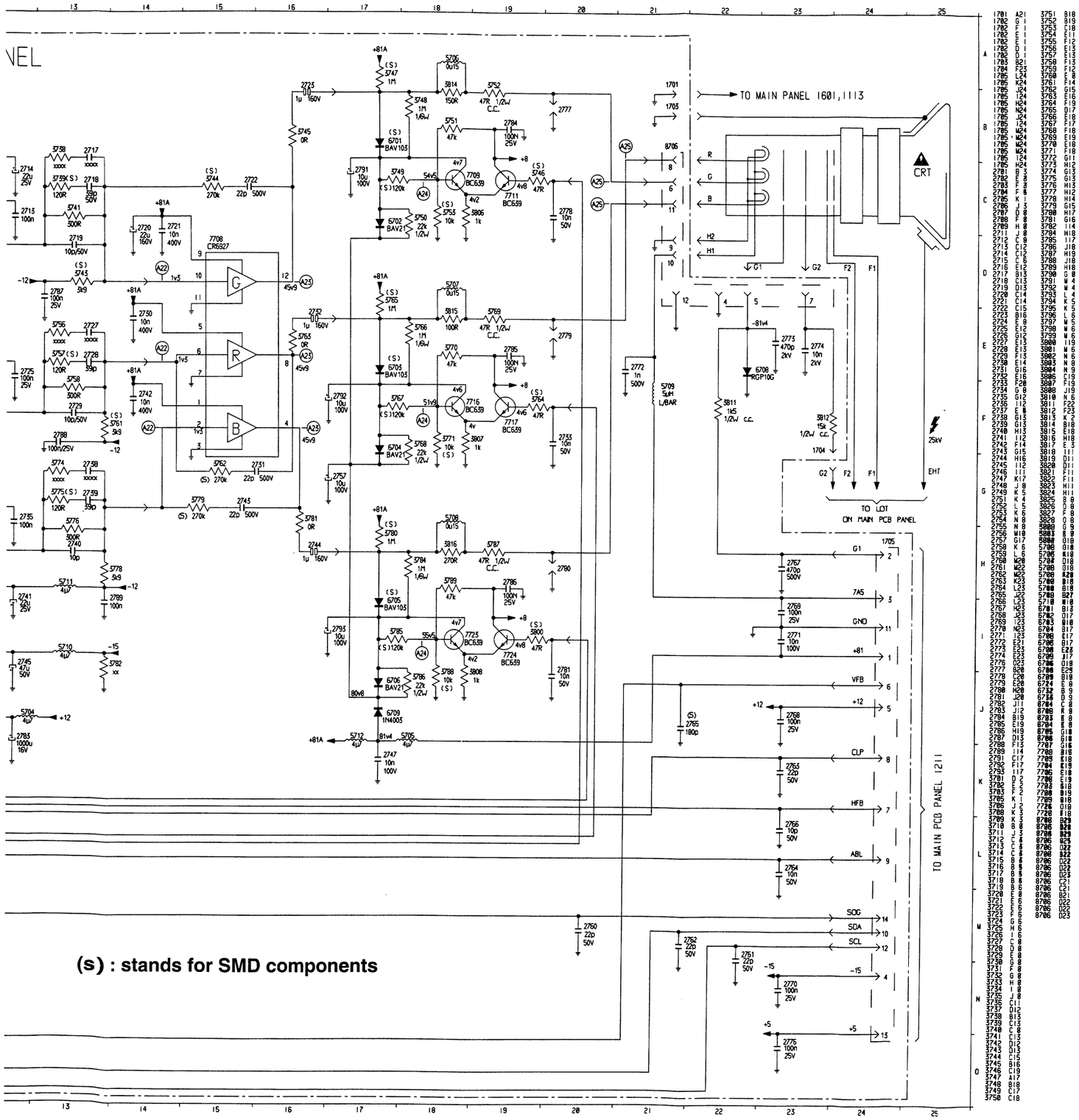
A26 8010-2

0.5 V/div AC
10 uS/div

Video Schematic Diagram

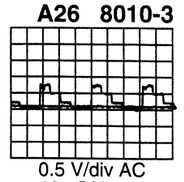
A2



Waveforms for Diagram A1

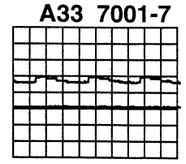


A26 8010-3



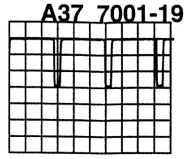
0.5 V/div AC
10 uS/div

A33 7001-7



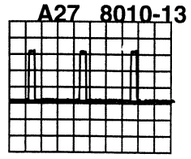
2 V/div AC
10 uS/div

A37 7001-19



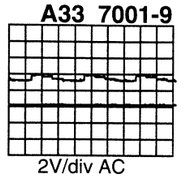
1 V/div AC
10 uS/div

A27 8010-13



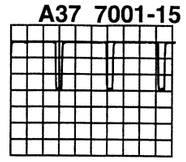
1V/div AC
10 uS/div

A33 7001-9



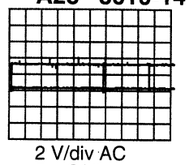
2V/div AC
10 uS/div

A37 7001-15



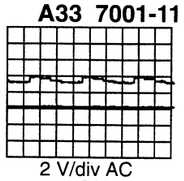
1 V/div AC
10 uS/div

A28 8010-14



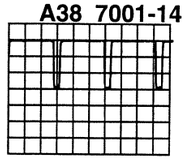
2 V/div AC
5 mS/div

A33 7001-11



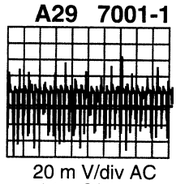
2 V/div AC
10 uS/div

A38 7001-14



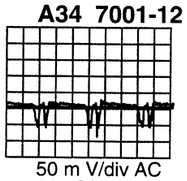
0.2 V/div AC
5 mS/div

A29 7001-1



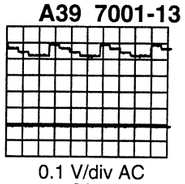
20 m V/div AC
.01 mS/div

A34 7001-12



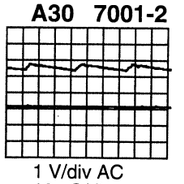
50 m V/div AC
10 uS/div

A39 7001-13



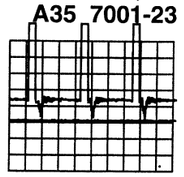
0.1 V/div AC
5 mS/div

A30 7001-2



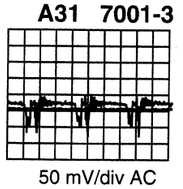
1 V/div AC
10 uS/div

A35 7001-23



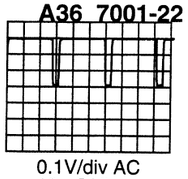
0.1V/div AC
10 uS/div

A31 7001-3



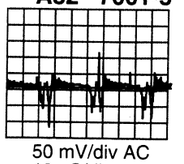
50 mV/div AC
10 uS/div

A36 7001-22



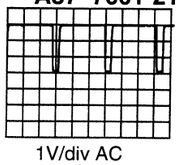
0.1V/div AC
10 uS/div

A32 7001-5



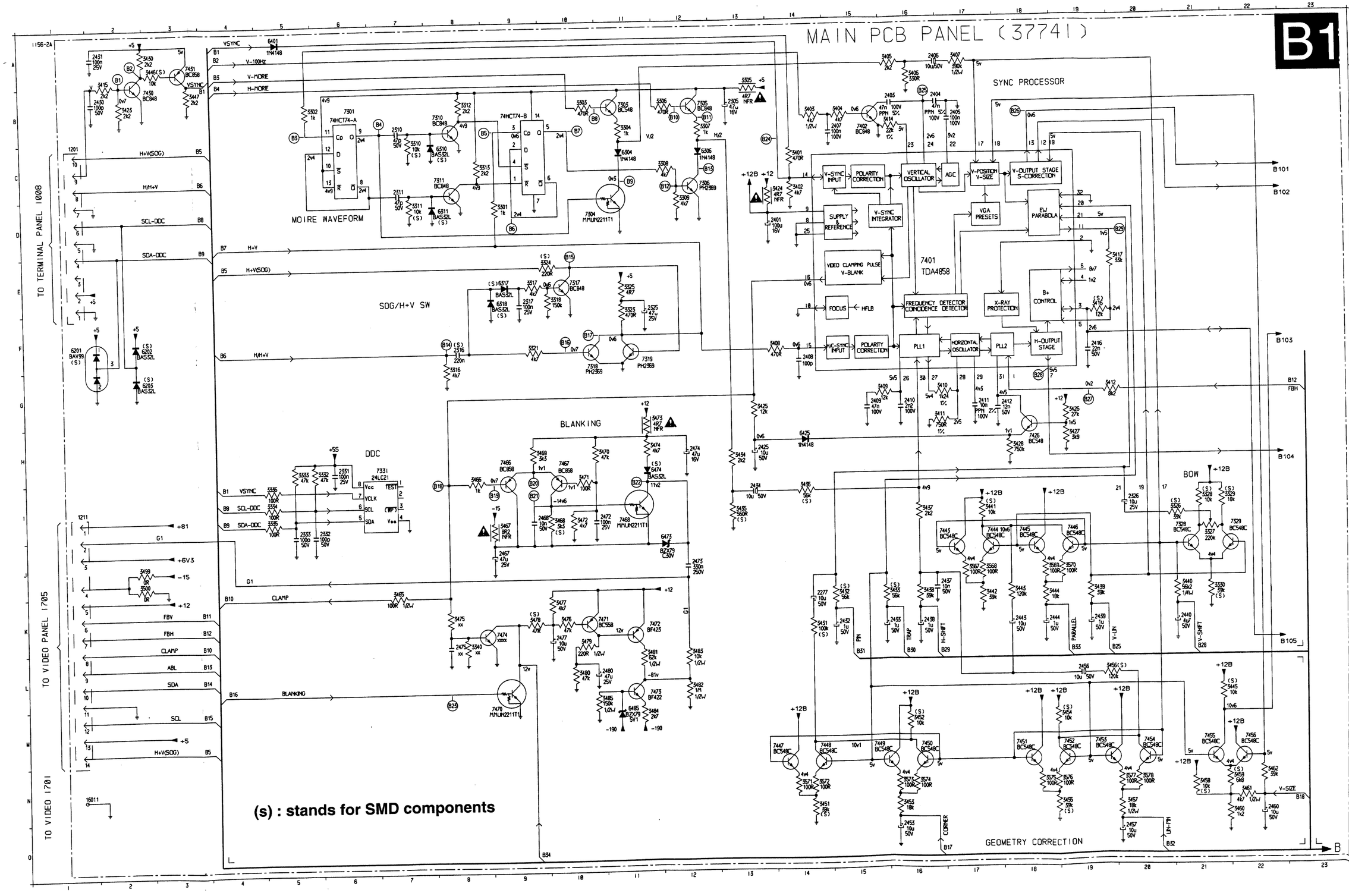
50 mV/div AC
10 uS/div

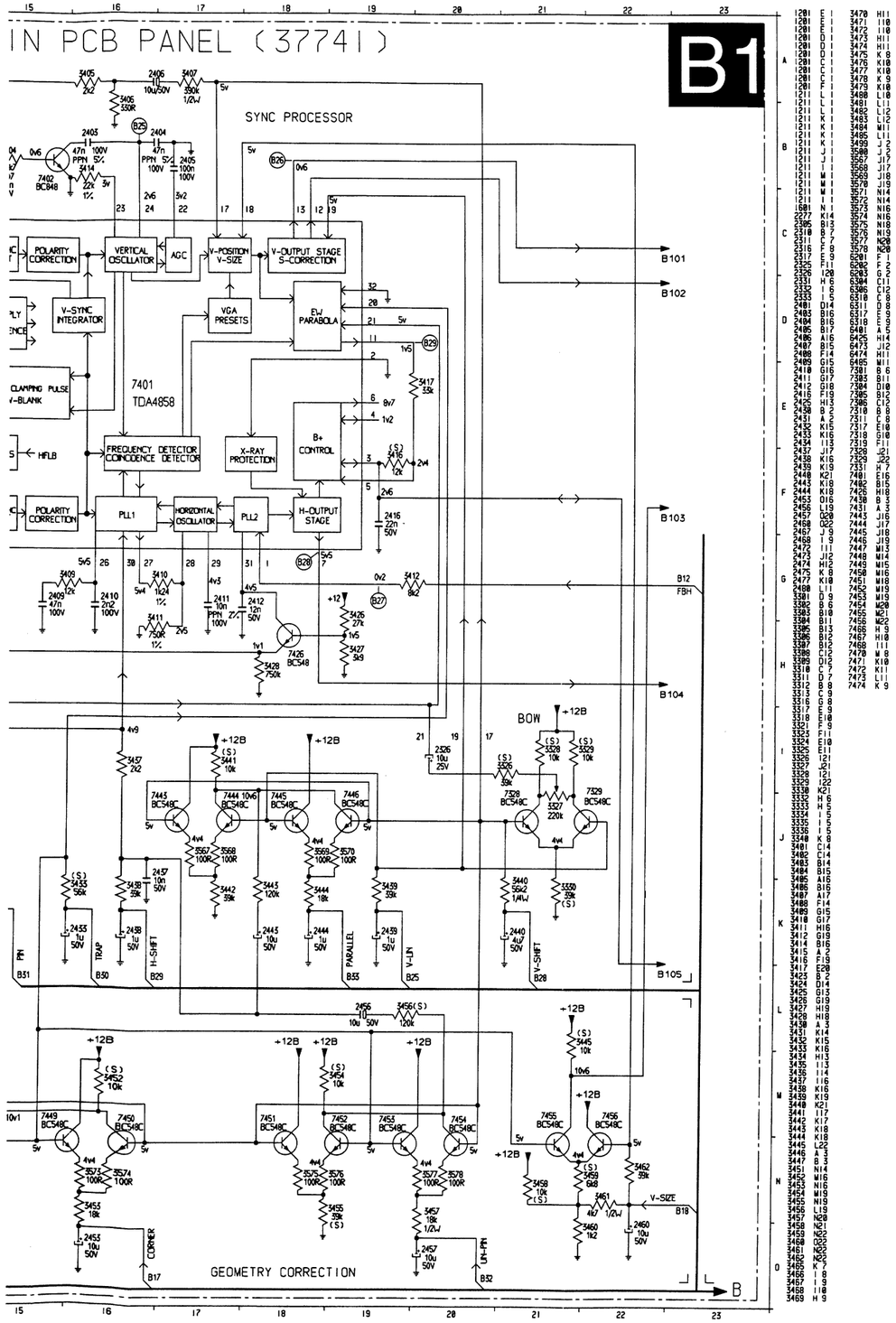
A37 7001-21



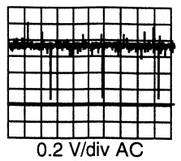
1V/div AC
10 uS/div

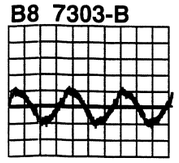
Deflection Schematic Diagram

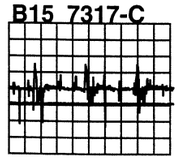


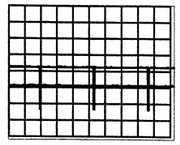


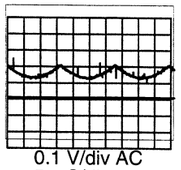
Waveforms for Diagram B1 and B2

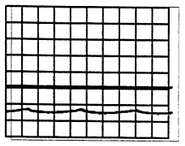
B1 7430-B

0.2 V/div AC
5 mS/div

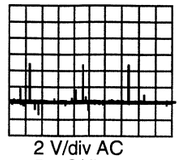
B8 7303-B

50 mV/div AC
20 uS/div

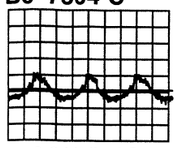
B15 7317-C

50 mV/div AC
10 uS/div

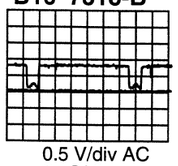
B22 7468-C

10 V/div AC
5 mS/div

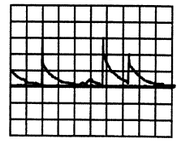
B29 7401-11

0.1 V/div AC
5 mS/div

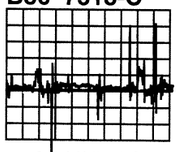
B36 7501-4

10 V/div AC
5 mS/div

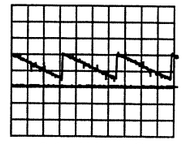
B2 7430-C

2 V/div AC
5 mS/div

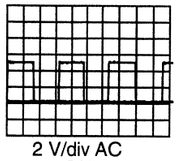
B9 7304-C

0.2 V/div AC
5 mS/div

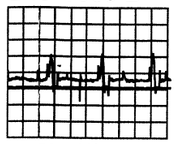
B16 7318-B

0.5 V/div AC
5 uS/div

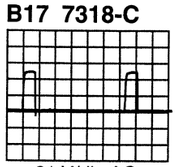
B23 7470-B

0.1 V/div AC
5 uS/div

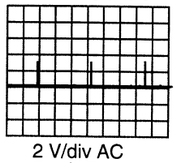
B30 7518-C

0.1 V/div AC
5 uS/div

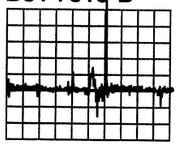
B37 7501-7

0.5 V/div AC
5 mS/div

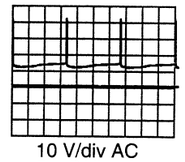
B3 7301-11

2 V/div AC
5 mS/div

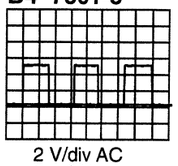
B10 7305-B

50 mV/div AC
10 uS/div

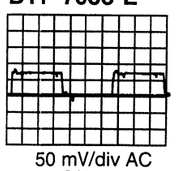
B17 7318-C

21 V/div AC
5 uS/div

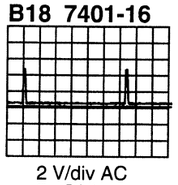
B24 7401-14

2 V/div AC
5 mS/div

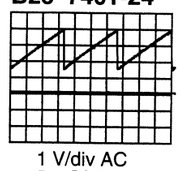
B31 7518-B

0.1 V/div AC
5 uS/div

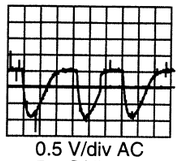
B38 7501-7

10 V/div AC
5 mS/div

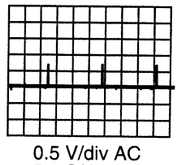
B4 7301-9

2 V/div AC
5 mS/div

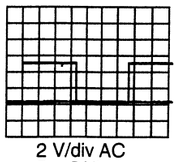
B11 7305-E

50 mV/div AC
5 uS/div

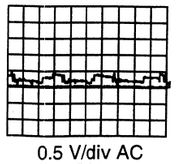
B18 7401-16

2 V/div AC
5 uS/div

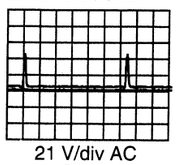
B25 7401-24

1 V/div AC
5 mS/div

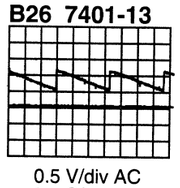
B32 7501-2

0.5 V/div AC
5 mS/div

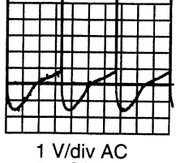
B39 7502-B

0.5 V/div AC
5 mS/div

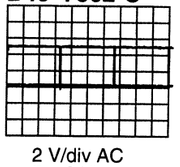
B5 7301-3

2 V/div AC
5 mS/div

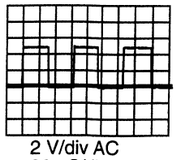
B12 7306-B

0.5 V/div AC
10 uS/div

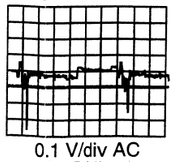
B19 7466-B

21 V/div AC
5 uS/div

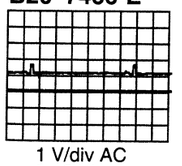
B26 7401-13

0.5 V/div AC
5 mS/div

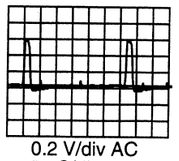
B33 7501-6

1 V/div AC
5 mS/div

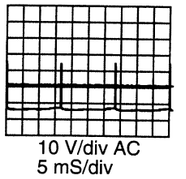
B40 7502-C

2 V/div AC
5 mS/div

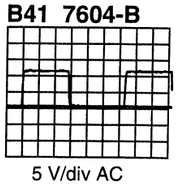
B6 7301-2

2 V/div AC
20 uS/div

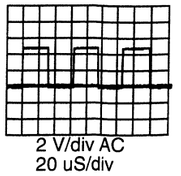
B13 7306-C

0.1 V/div AC
10 uS/div

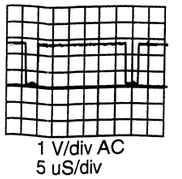
B20 7466-E

1 V/div AC
5 uS/div

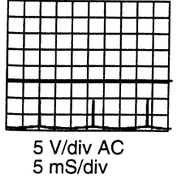
B27 7401-7

0.2 V/div AC
5 uS/div

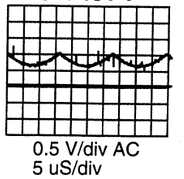
B34 7501-3

10 V/div AC
5 mS/div

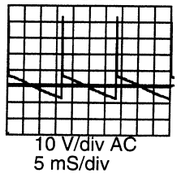
B41 7604-B

5 V/div AC
5 uS/div

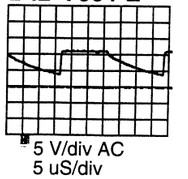
B7 7301-5

2 V/div AC
20 uS/div

B14 3316

1 V/div AC
5 uS/div

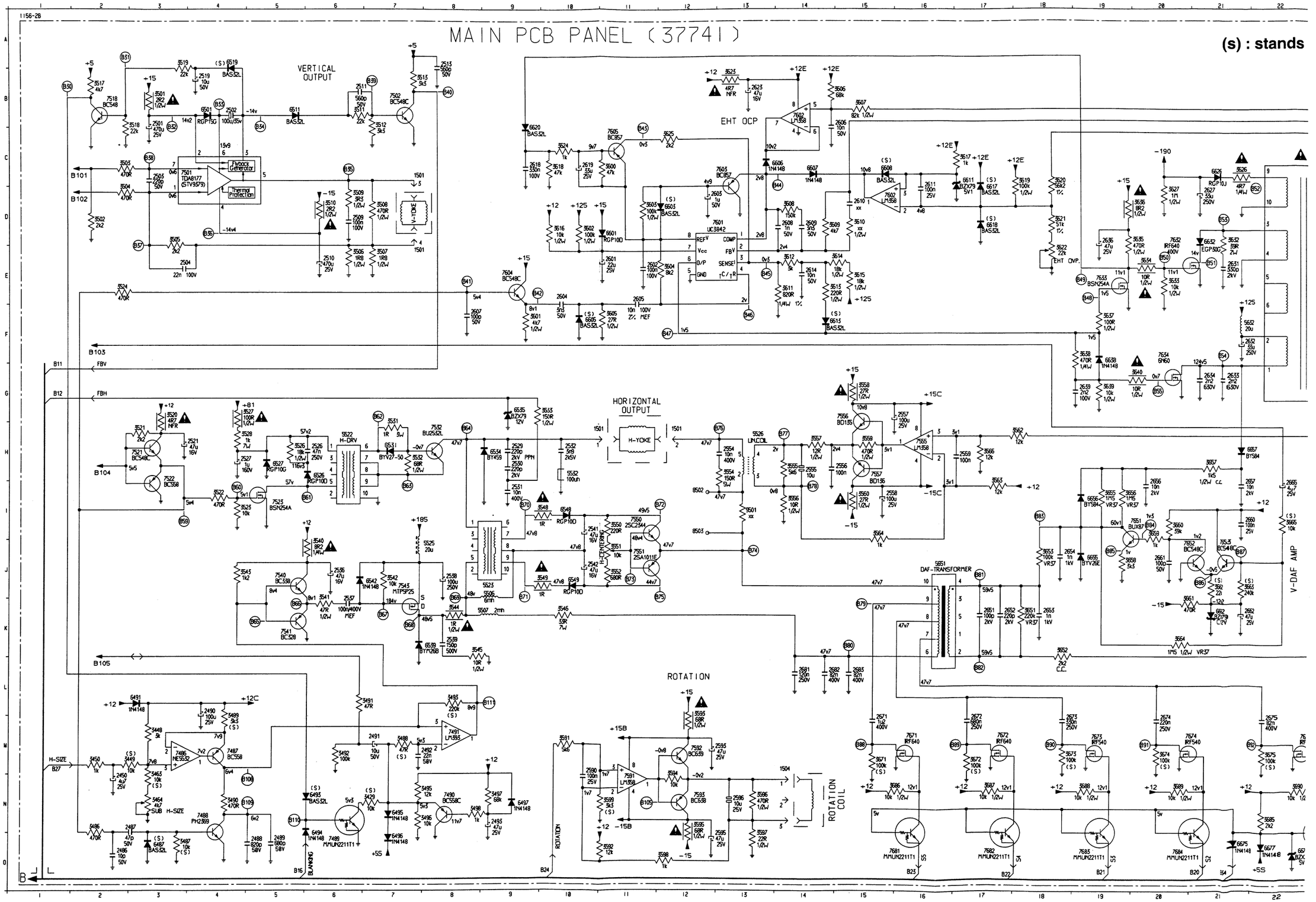
B21 7467-C

5 V/div AC
5 mS/div

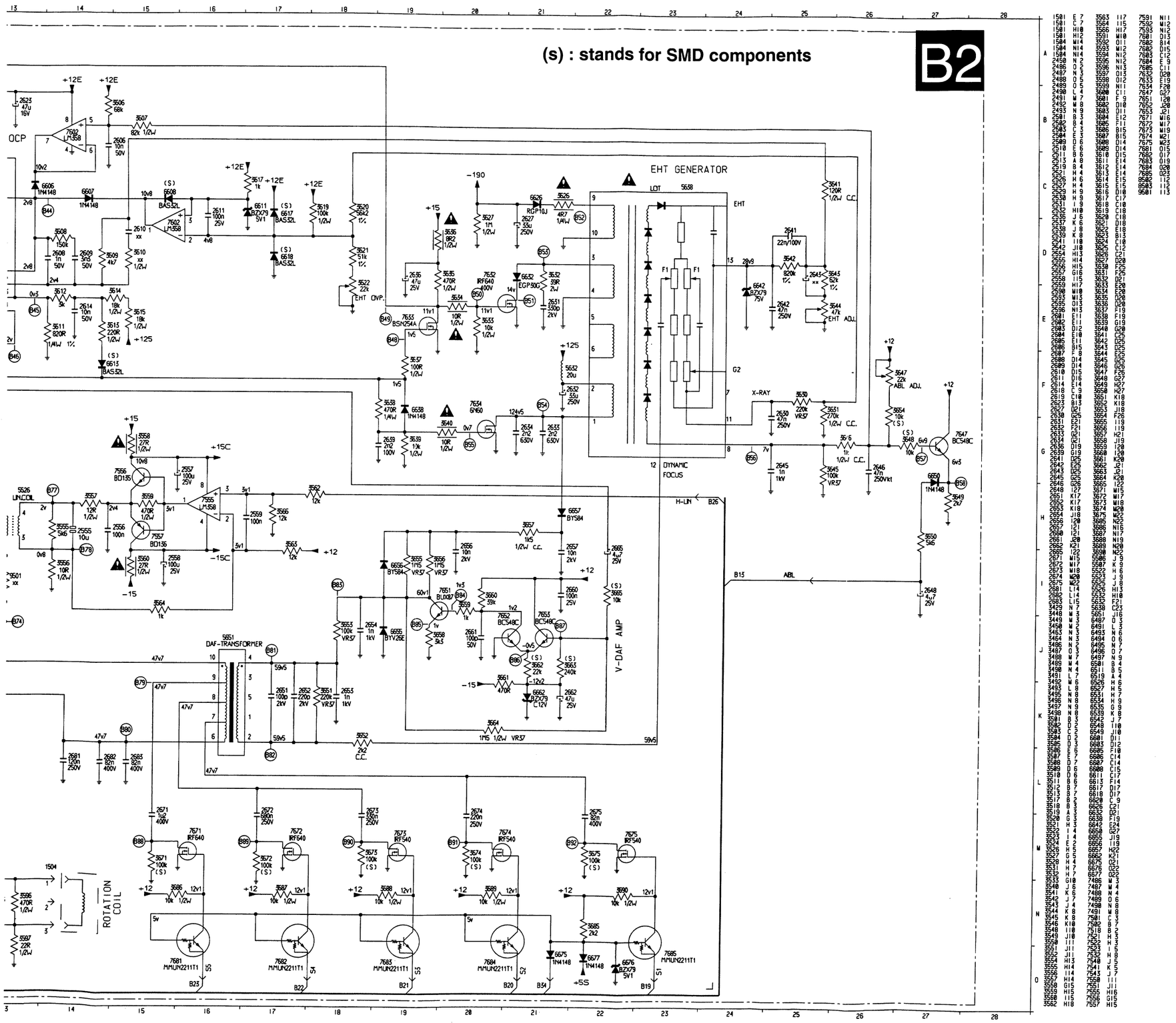
B28 7401-7

0.5 V/div AC
5 uS/div

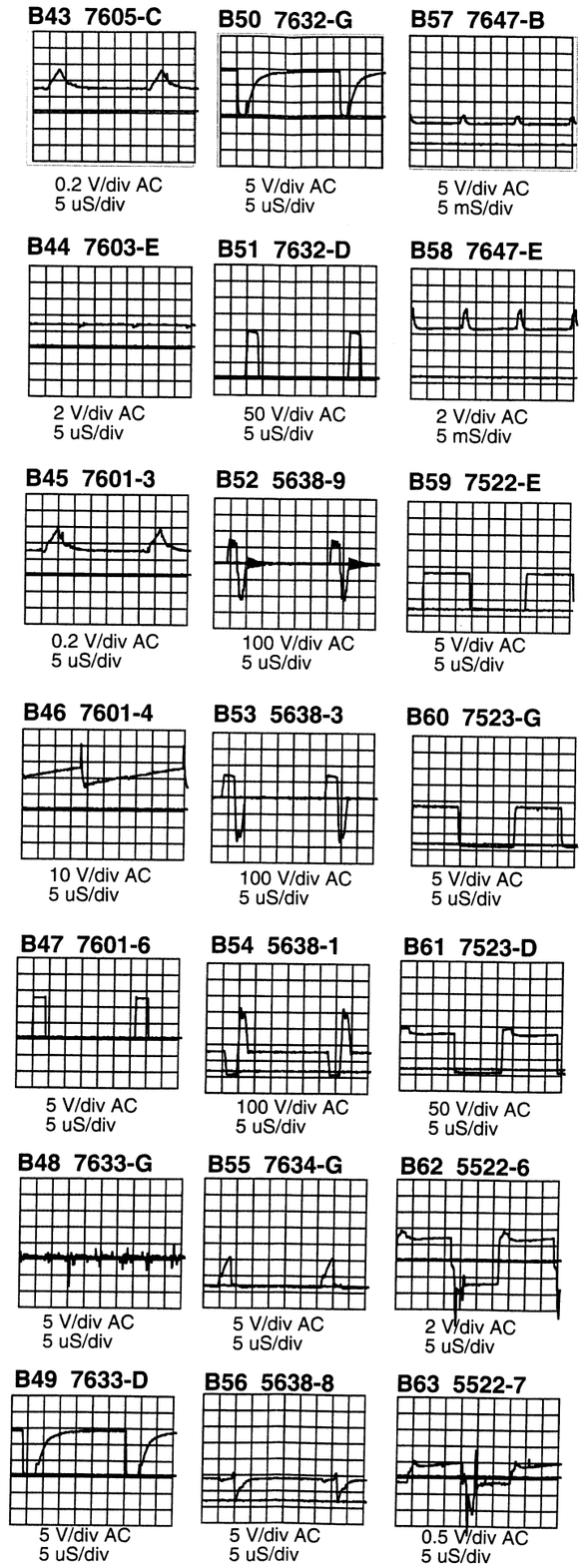
B35 7501-5

10 V/div AC
5 mS/div

B42 7604-E

5 V/div AC
5 uS/div

Deflection Schematic Diagram

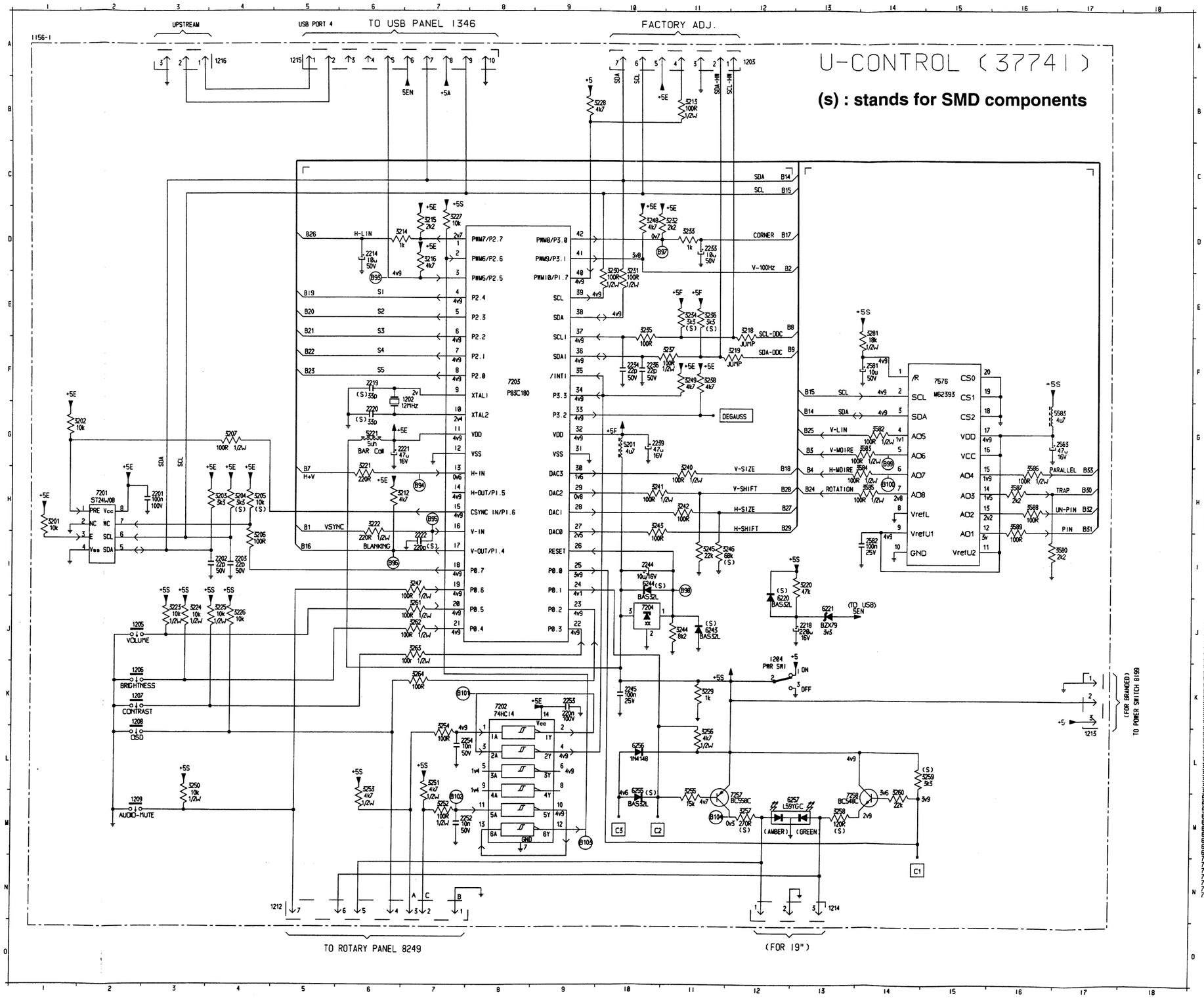



(s) : stands for SMD components
B2
EHT GENERATOR
DYNAMIC FOCUS
V-DAF AMP
DAF-TRANSFORMER
ROTATION COIL
OCP
EHT OVP.
EHT ADJ.
ABL ADJ.
X-RAY
H-LIN
ABL


B43 7605-C
0.2 V/div AC
5 uS/div
B50 7632-G
5 V/div AC
5 uS/div
B57 7647-B
5 V/div AC
5 mS/div
B44 7603-E
2 V/div AC
5 uS/div
B51 7632-D
50 V/div AC
5 uS/div
B58 7647-E
2 V/div AC
5 mS/div
B45 7601-3
0.2 V/div AC
5 uS/div
B52 5638-9
100 V/div AC
5 uS/div
B59 7522-E
5 V/div AC
5 uS/div
B46 7601-4
10 V/div AC
5 uS/div
B53 5638-3
100 V/div AC
5 uS/div
B60 7523-G
5 V/div AC
5 uS/div
B47 7601-6
5 V/div AC
5 uS/div
B54 5638-1
100 V/div AC
5 uS/div
B61 7523-D
50 V/div AC
5 uS/div
B48 7633-G
5 V/div AC
5 uS/div
B55 7634-G
5 V/div AC
5 uS/div
B62 5522-6
2 V/div AC
5 uS/div
B49 7633-D
5 V/div AC
5 uS/div
B56 5638-8
5 V/div AC
5 uS/div
B63 5522-7
0.5 V/div AC
5 uS/div

U-CTRL Schematic Diagram

B3



B64 7532-C
100 V/div AC
5 uS/div

B65 7540-B
5 V/div AC
5 uS/div

B66 7540-E
5 V/div AC
5 uS/div

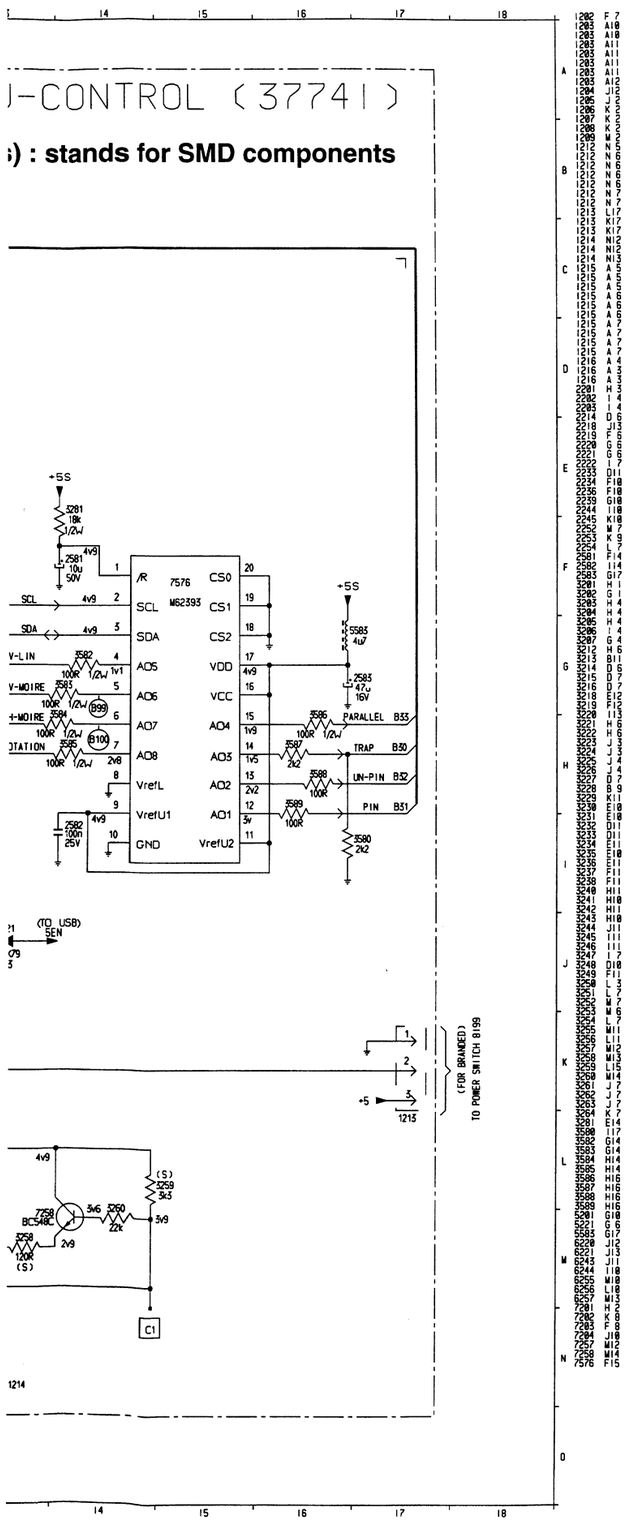
B67 7543-G
100 V/div AC
50 uS/div

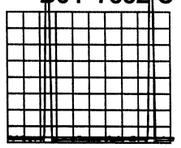
B68 7543-D
100 V/div AC
5 uS/div

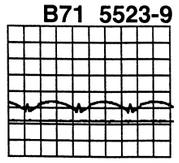
B69 5523-5
100 V/div AC
5 uS/div

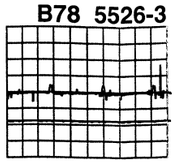
B70 5523-7
50V/div AC
10 uS/div

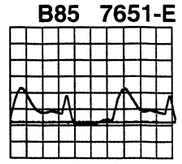
Waveforms for Diagram B2 and B3

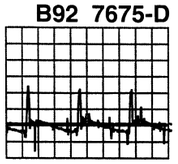


B64 7532-C

100 V/div AC
5 uS/div

B71 5523-9

50 V/div AC
10 uS/div

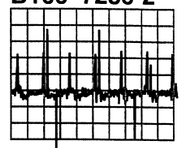
B78 5526-3

0.5 V/div AC
10 uS/div

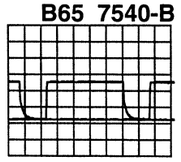
B85 7651-E

2V/div AC
5 uS/div

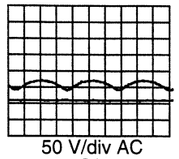
B92 7675-D

0.1V/div AC
10 uS/div

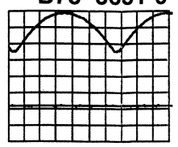
B99 7576-5

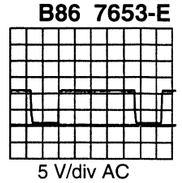
50 mV/div AC
5 uS/div

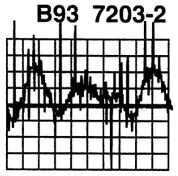
B106 7286-2

0.1 V/div AC
20 uS/div

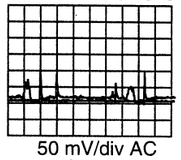
B65 7540-B

5 V/div AC
5 uS/div

B72 7550-C

50 V/div AC
10 uS/div

B79 5651-9

10 V/div AC
5 uS/div

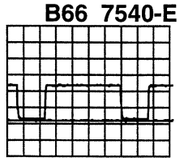
B86 7653-E

5 V/div AC
5 uS/div

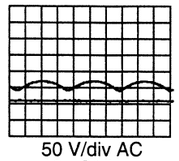
B93 7203-2

50 mV/div AC
10 uS/div

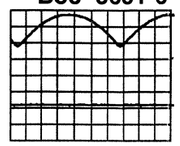
B100 7576-6

50 mV/div AC
5 uS/div

B107 7286-4

0.1 V/div AC
20 uS/div

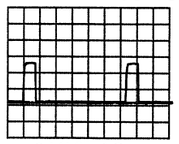
B66 7540-E

5 V/div AC
5 uS/div

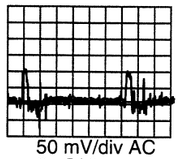
B73 7550-B

50 V/div AC
10 uS/div

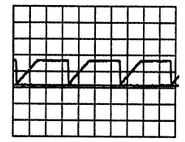
B80 5651-6

10 V/div AC
5 uS/div

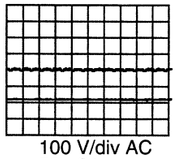
B87 7653-B

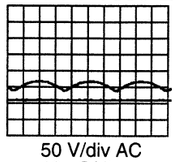
0.2 V/div AC
5 uS/div

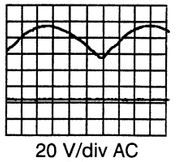
B94 7203-13

2 V/div AC
5 uS/div

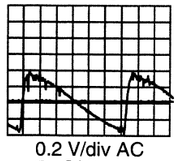
B101 7202-3

50 mV/div AC
5 uS/div

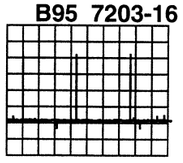
B108 7487-C

2 V/div AC
5 mS/div

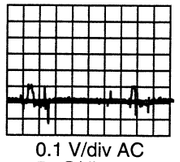
B67 7543-G

100 V/div AC
50 uS/div

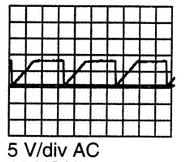
B74 7550-E

50 V/div AC
10 uS/div

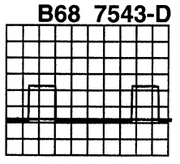
B81 5651-4

20 V/div AC
5 uS/div

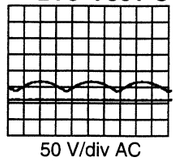
B88 7671-D

0.2 V/div AC
5 uS/div

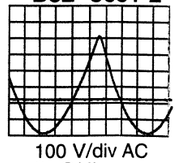
B95 7203-16

1 V/div AC
5 mS/div

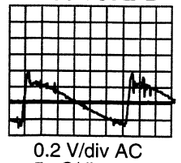
B102 7202-11

0.1 V/div AC
5 uS/div

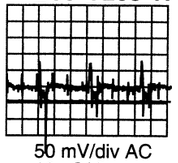
B109 7488-C

5 V/div AC
10 US/div

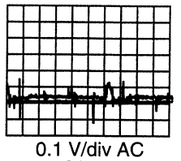
B68 7543-D

100 V/div AC
5 uS/div

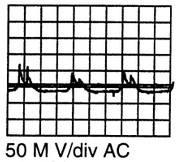
B75 7551-C

50 V/div AC
10 uS/div

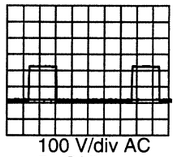
B82 5651-2

100 V/div AC
5 uS/div

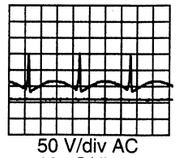
B89 7672-D

0.2 V/div AC
5 uS/div

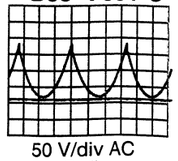
B96 7203-17

50 mV/div AC
10 uS/div

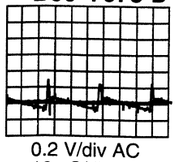
B103 7202-12

0.1 V/div AC
5 uS/div

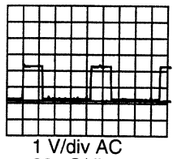
B110 7489-B

50 M V/div AC
10 US/div

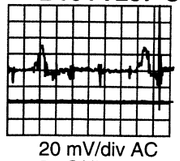
B69 5523-5

100 V/div AC
5 uS/div

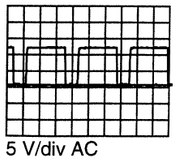
B76 5526-5

50 V/div AC
10 uS/div

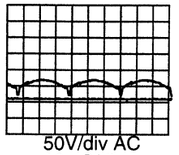
B83 7651-C

50 V/div AC
5 mS/div

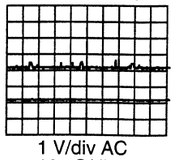
B90 7673-D

0.2 V/div AC
10 uS/div

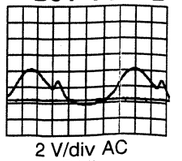
B97 7203-42

1 V/div AC
20 uS/div

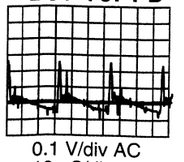
B104 7257-C

20 mV/div AC
5 uS/div

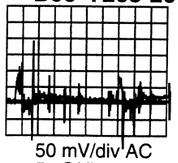
B111 7491-1

5 V/div AC
10 US/div

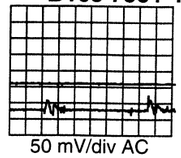
B70 5523-7

50V/div AC
10 uS/div

B77 5526-4

1 V/div AC
10 uS/div

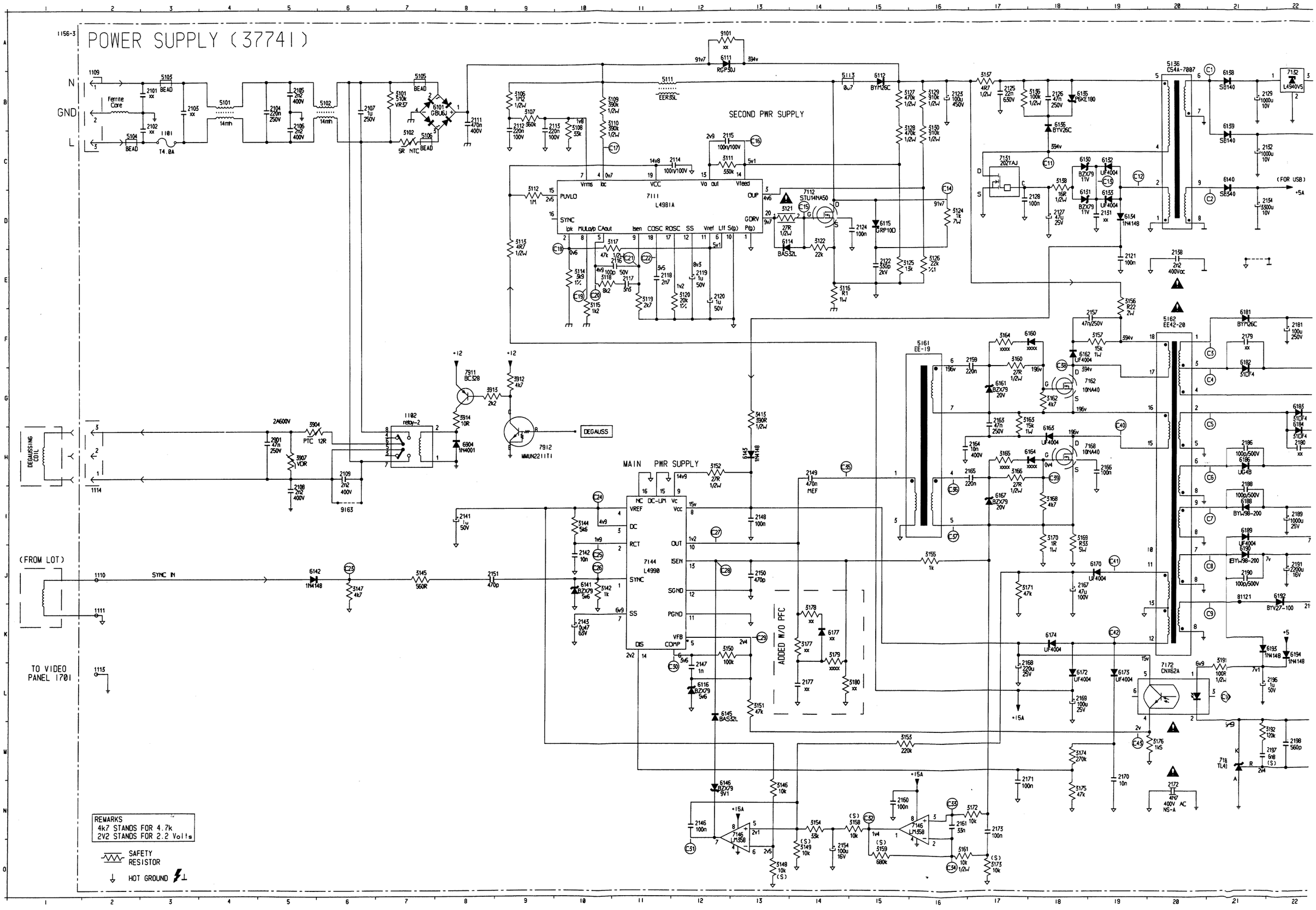
B84 7651-B

2 V/div AC
5 uS/div

B91 7674-D

0.1 V/div AC
10 uS/div

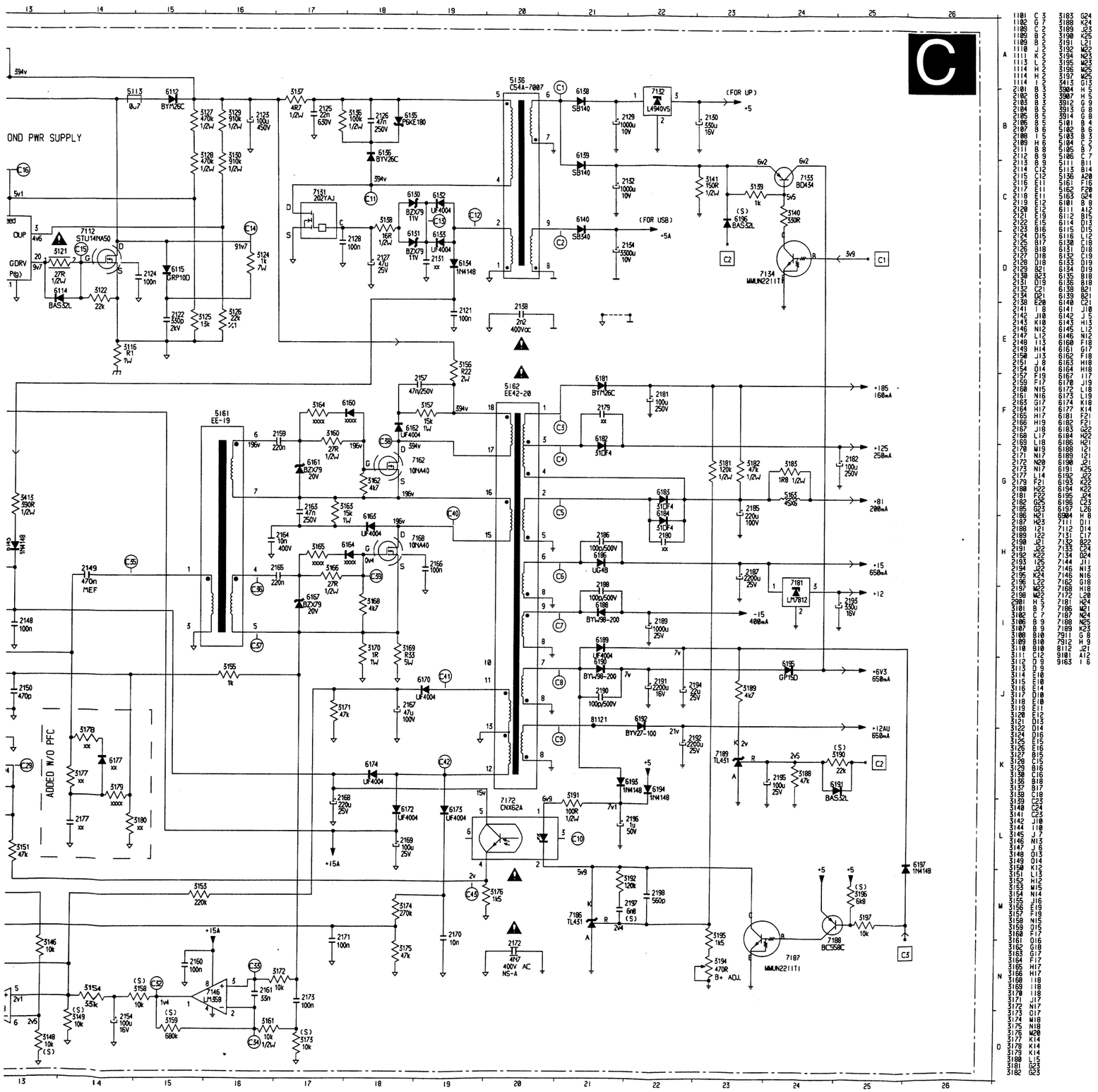
B98 7203-26

50 mV/div AC
5 uS/div

B105 7591-1

50 mV/div AC
5 uS/div

Power Supply Schematic Diagram



Waveforms for Diagram C



C1 5136-6
5 V/div AC
5 uS/div

C8 5162-7
20 V/div AC
5 uS/div

C15 7112-G
10V/div AC
5 uS/div

C2 5136-9
5 V/div AC
5 uS/div

C9 6192(+)
20 V/div AC
5 uS/div

C16 7111-14
5 V/div AC
5 uS/div

C3 5162-1
100 V/div AC
5 uS/div

C10 7172-3
50 m V/div AC
5 uS/div

C17 7111-4
0.5 V/div AC
2 mS/div

C4 5162-3
100 V/div AC
5 uS/div

C11 5136-4
100 V/div AC
5 uS/div

C18 7111-2
0.5 V/div AC
0.5 uS/div

C5 5162-2
100 V/div AC
5 uS/div

C12 5136-2
50 V/div AC
5 uS/div

C19 7111-8
0.2 V/div AC
0.5 uS/div

C6 5162-6
50 V/div AC
5 uS/div

C13 6132(-)
10 V/div AC
5 uS/div

C20 7111-5
2 V/div AC
0.5 uS/div

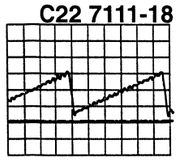
C7 5162-9
50 V/div AC
5 uS/div

C14 7112-D
100 V/div AC
5 uS/div

C21 7111-9
0.2 V/div AC
0.5 uS/div

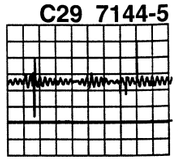
Waveforms for Diagram C

C22 7111-18



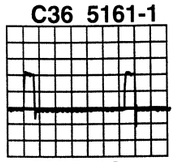
2 V/div AC
5 uS/div

C29 7144-5



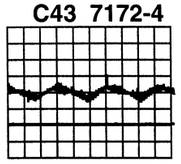
1 V/div AC
5 uS/div

C36 5161-1



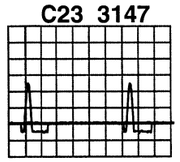
5 V/div AC
5 uS/div

C43 7172-4



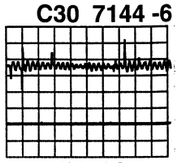
1 V/div AC
10 uS/div

C23 3147



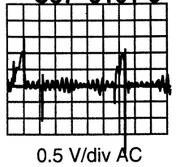
5 V/div AC
5 uS/div

C30 7144 -6



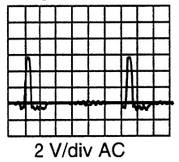
1 V/div AC
5 uS/div

C37 5161-5



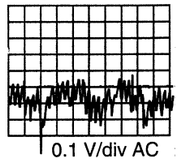
0.5 V/div AC
5 uS/div

C24 7144-4



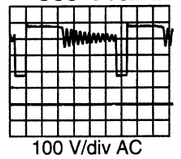
2 V/div AC
5 uS/div

C31 7146-7



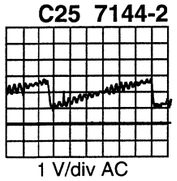
0.1 V/div AC
5 uS/div

C38 7162-D



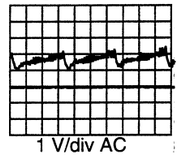
100 V/div AC
5 uS/div

C25 7144-2



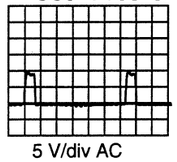
1 V/div AC
5 uS/div

C32 7146-1



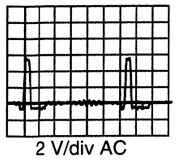
1 V/div AC
10 uS/div

C39 7168-G



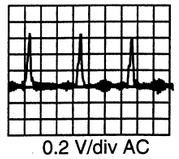
5 V/div AC
5 uS/div

C26 7144-1



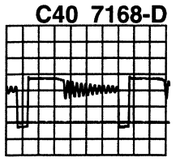
2 V/div AC
5 uS/div

C33 7146-3



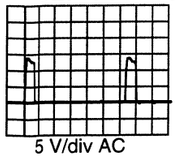
0.2 V/div AC
10 uS/div

C40 7168-D



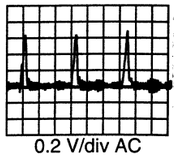
100 V/div AC
5 uS/div

C27 7144-10



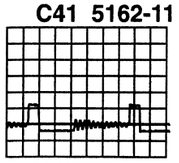
5 V/div AC
5 uS/div

C34 7146-2



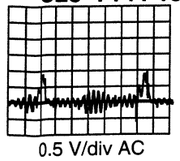
0.2 V/div AC
10 uS/div

C41 5162-11



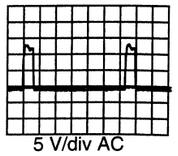
50 V/div AC
5 uS/div

C28 7144-13



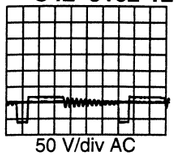
0.5 V/div AC
5 uS/div

C35 5161-1

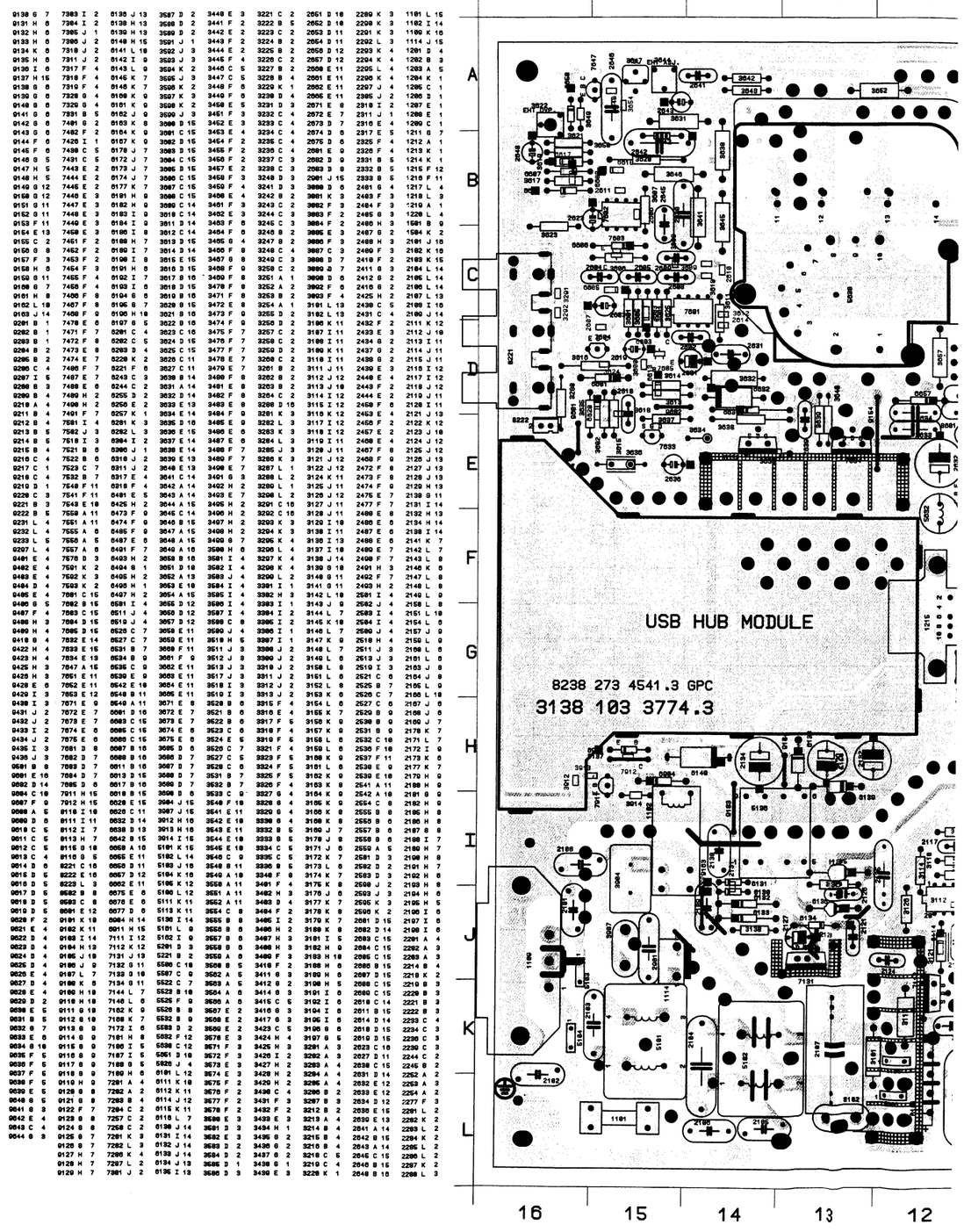


5 V/div AC
5 uS/div

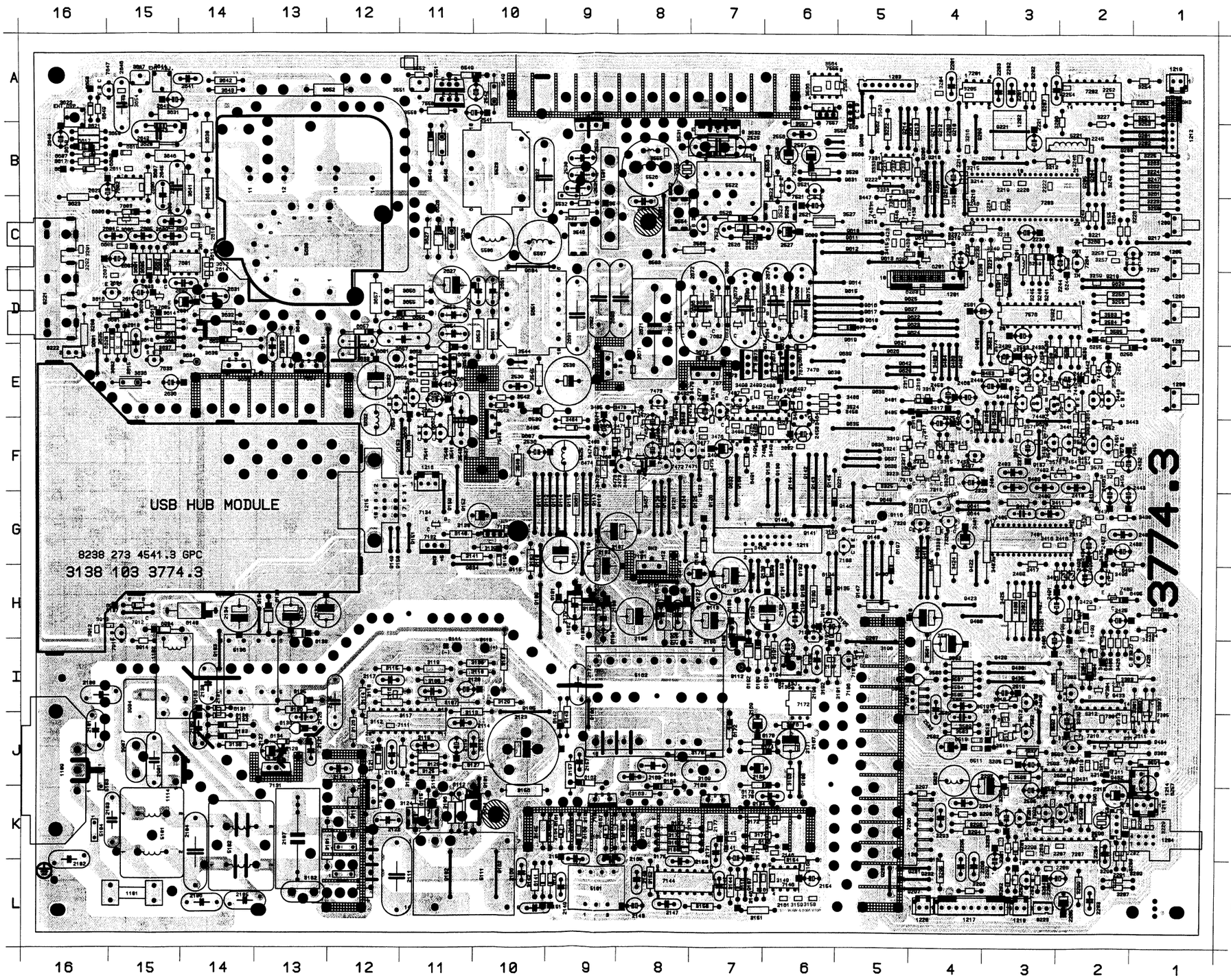
C42 5162-12



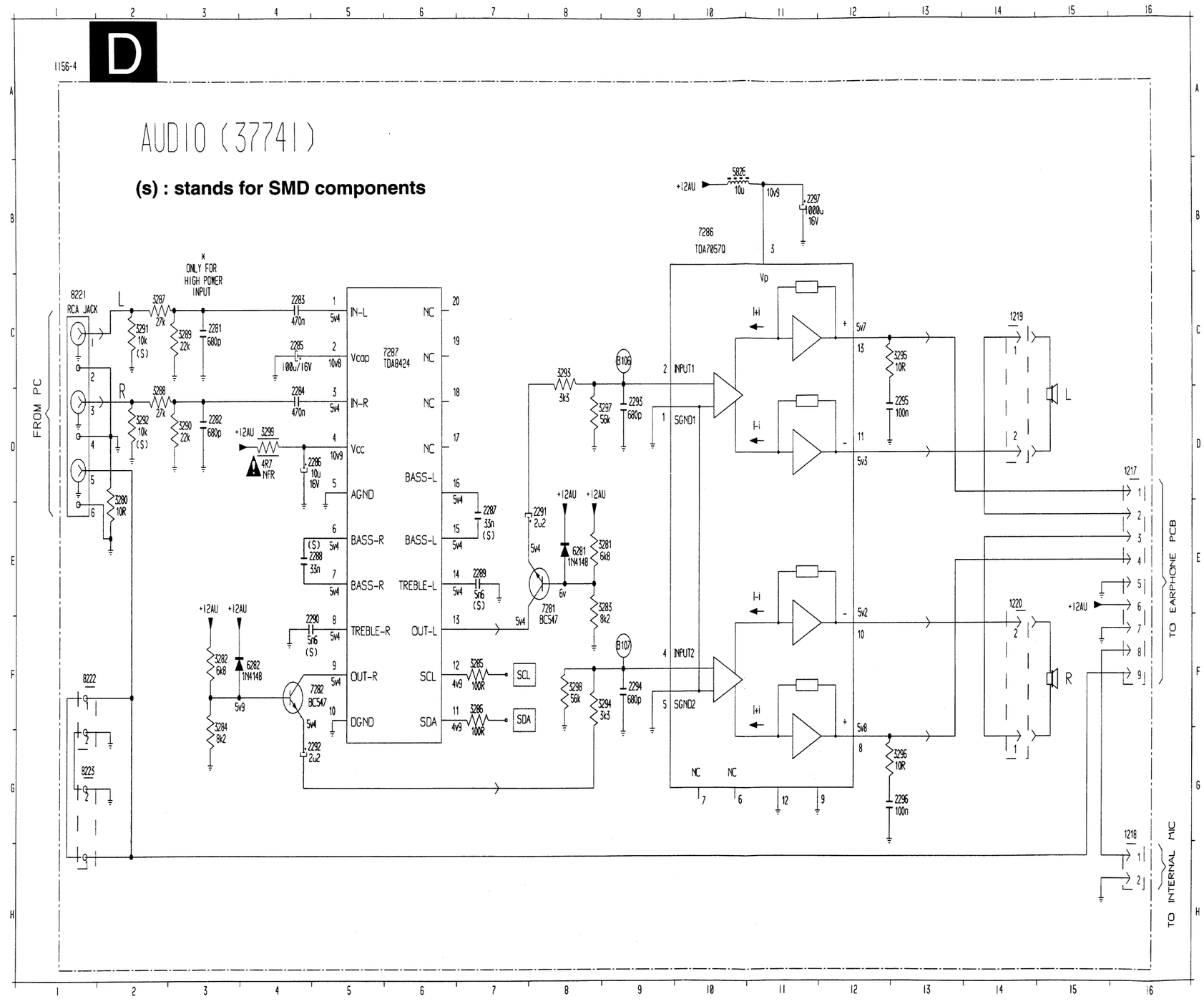
50 V/div AC
5 uS/div

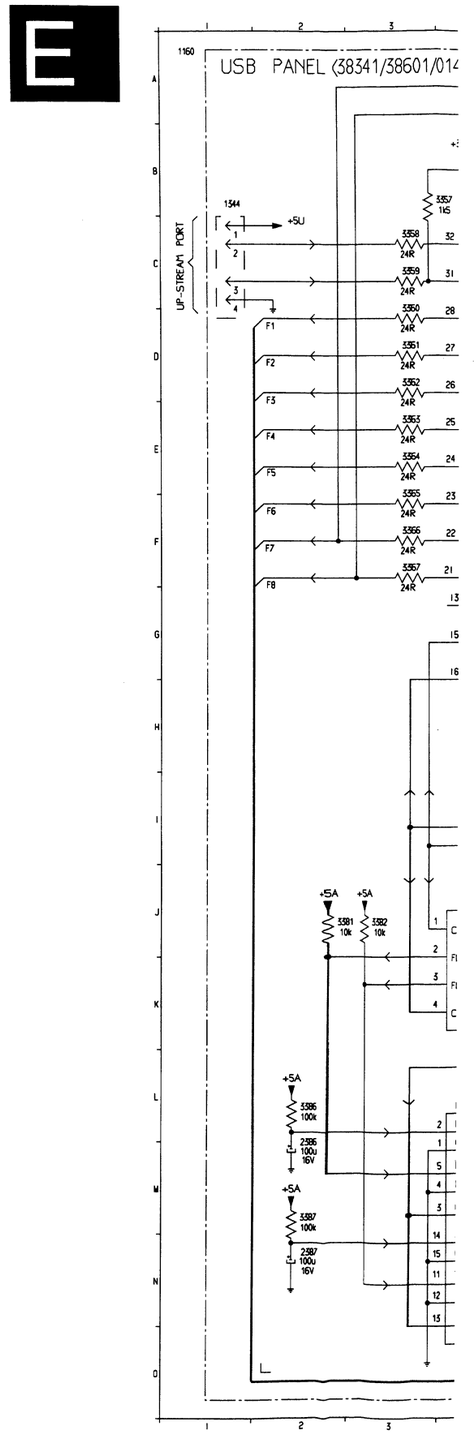


Main Panel C.B.A. (B1, B2, B3, C and D)



Audio Schematic Diagram





USB Schematic Diagram (Optional)

E

USB PANEL (38341/38601/014)

7341 PDIUSBH11B

TO EARPHONE PCB

TO INTERNAL MIC

UP-STREAM PORT

TO MAIN PCB PANEL 1215

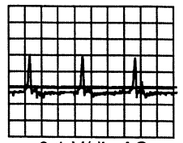
DOWN-STREAM PORT-1

DOWN-STREAM PORT-2

DOWN-STREAM PORT-3

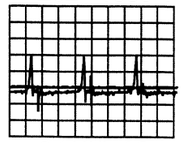
DOWN-STREAM PORT-4

E01 1082-1



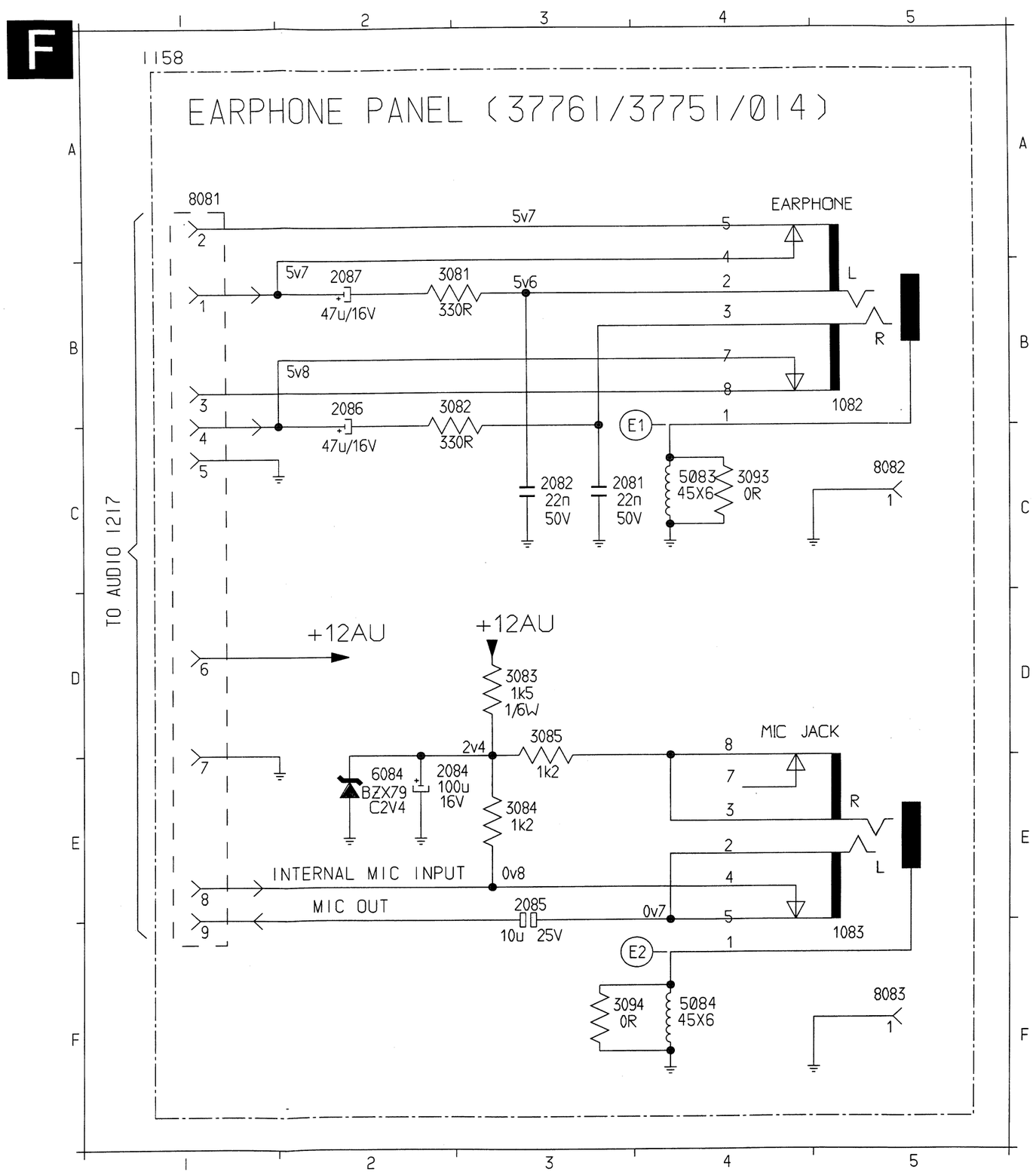
0.1 V/div AC
10 uS/div

E02 1083-1



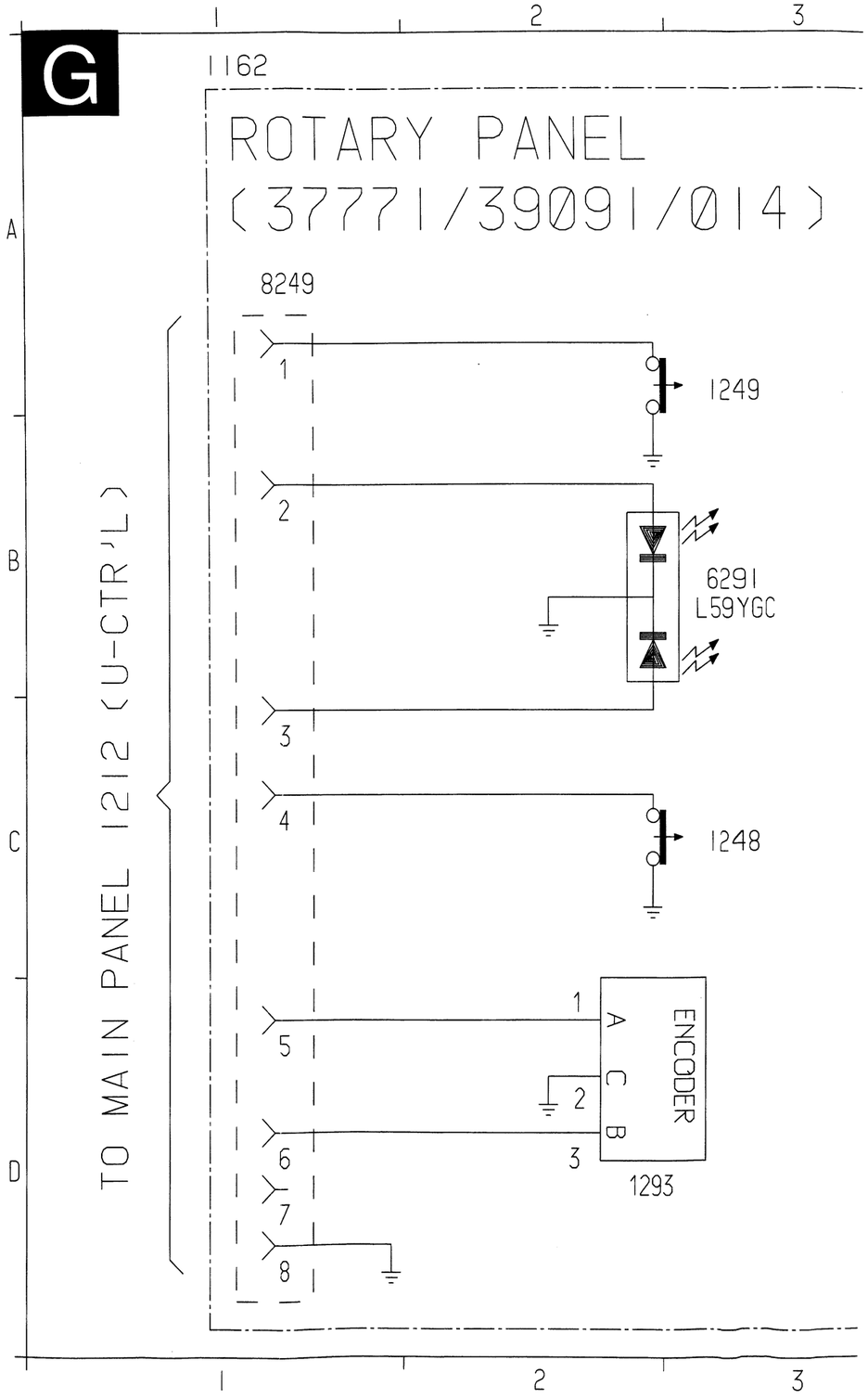
0.1 V/div AC
10 uS/div

Earphone Schematic Diagram



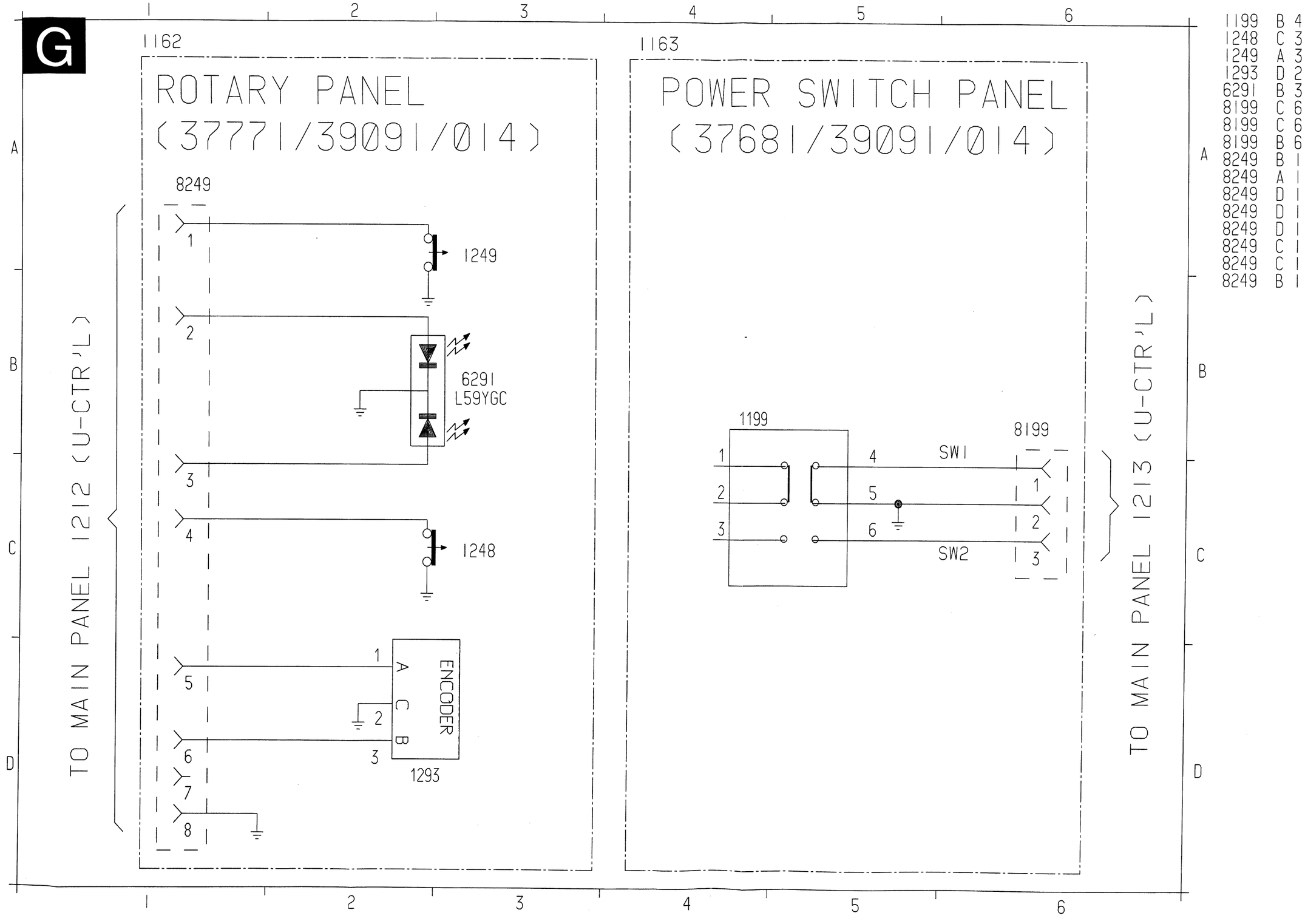
1082	B	5
1083	F	5
2081	C	3
2082	C	3
2084	E	2
2085	E	3
2086	B	2
2087	B	2
3081	B	2
3082	B	2
3083	D	3
3084	E	3
3085	D	3
3093	C	4
3094	F	3
5083	C	4
5084	F	4
6084	E	2
8081	D	1
8081	C	1
8081	B	1
8081	B	1
8081	B	1
8081	A	1
8081	E	1
8081	E	1
8081	D	1
8082	C	5
8083	F	5

Rotary Schematic Diagram

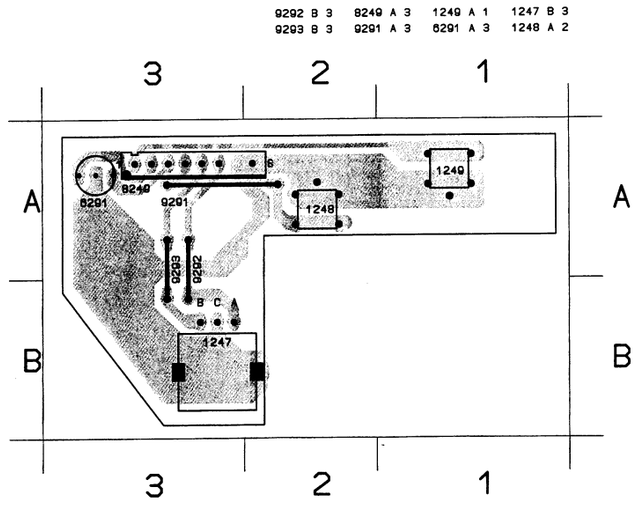


Rotary Schematic Diagram

Power Switch Schematic Diagram

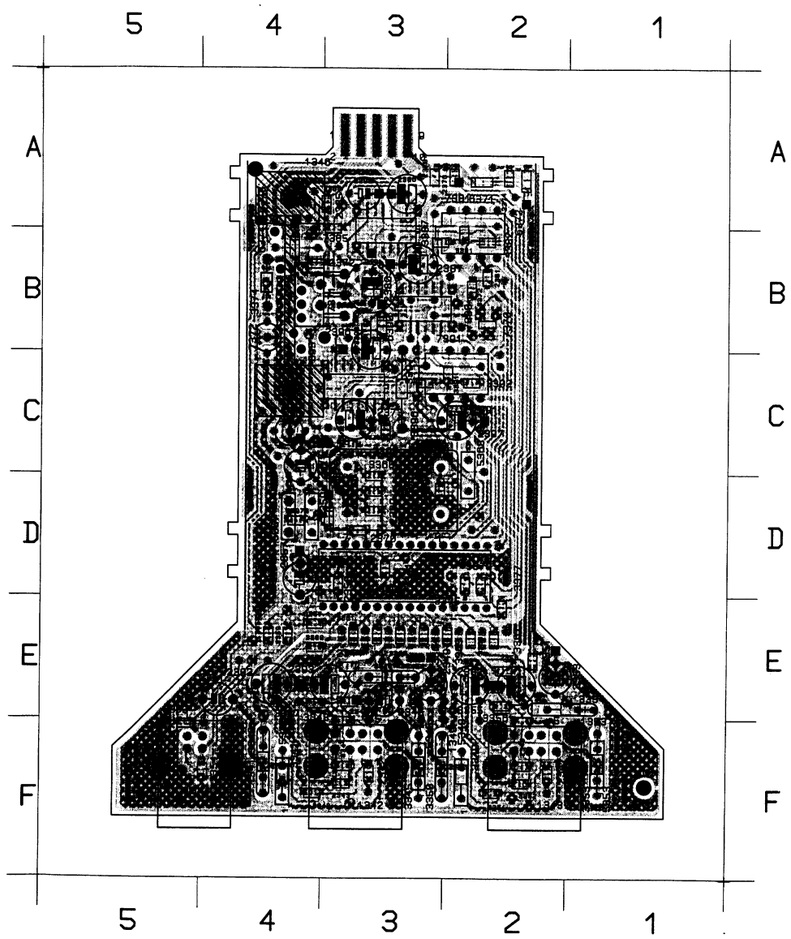


Rotary Panel C.B.A. (G)



USB Panel C.B.A. (E)

7341 D 3	3345 F 3	1341 F 4
7370 B 2	3346 E 3	1342 F 3
7371 B 3	3347 E 4	1343 F 2
7372 B 4	3348 F 3	1344 F 5
7373 C 4	3349 F 2	1345 E 3
7380 B 3	3350 F 3	1346 A 3
7381 A 2	3351 F 2	1349 F 3
7385 A 3	3352 F 2	1353 E 2
7391 B 3	3353 F 1	1368 D 3
7395 C 3	3354 E 1	2341 E 4
	3355 E 2	2342 F 3
	3356 F 2	2343 F 3
	3357 E 4	2344 E 3
	3358 E 4	2345 E 3
	3359 E 4	2346 E 3
	3360 E 3	2347 F 2
	3361 E 3	2348 F 2
	3362 E 3	2349 E 3
	3363 E 3	2350 E 2
	3364 E 3	2351 E 2
	3365 E 2	2352 F 5
	3366 E 2	2353 E 2
	3367 E 2	2354 F 4
	3368 D 3	2357 D 4
	3369 D 3	2358 D 3
	3370 D 4	2359 D 3
	3371 C 3	2368 D 3
	3372 B 2	2369 D 3
	3374 B 4	2370 D 3
	3375 D 2	2371 B 3
	3377 E 2	2372 B 4
	3379 D 2	2373 C 3
	3381 A 2	2374 A 2
	3382 B 2	2375 D 4
	3386 A 3	2376 A 2
	3387 B 3	2378 A 3
	3390 B 3	2380 B 3
	3391 C 2	2381 B 2
	3392 C 2	2382 E 2
	3396 B 3	2383 E 2
	3397 C 3	2385 A 3
	5341 F 4	2386 A 3
	5345 F 3	2387 B 3
	5349 F 2	2390 A 3
	5353 F 1	2391 C 2
	5357 D 4	2392 E 4
	5359 D 4	2393 E 3
	5368 D 2	2395 C 3
	6370 D 3	2396 B 3
	6371 A 2	2397 C 3
	6372 A 2	3341 F 4
	6373 A 4	3342 F 4
	6374 B 4	3343 F 4
	6390 B 3	3344 F 3



Repair tips

Warning

All ICs and many other semiconductors are susceptible to electrostatic discharges (ESD). Careless handling during repair can reduce life drastically. When repairing, make sure that you are connected with the same potential as the mass of the unit via a wrist wrap with resistance. Keep components and tools also at the same potential.

1. Servicing of SMDs (Surface Mounted Devices)

1.1 General cautions on handling and storage
- Oxidation on the terminals of SMDs results in poor soldering. Do not handle SMDs with bare hands.
- Avoid using storage places that are sensitive to oxidation such as places with sulphur or chlorine gas, direct sunlight, high temperatures or a high degree of humidity. The capacitance or resistance value of the SMDs may be affected by this.
- Rough handling of circuit boards containing SMDs may cause damage to the components as well as the circuit boards. Circuit boards containing SMDs should never be bent or flexed. Different circuit board materials expand and contract at different rates when heated or cooled and the components and/or solder connections may be damaged due to the stress. Never rub or scrape chip components as this may cause the value of the component to change. Similarly, do not slide the circuit board across any surface.

1.2 Removal of SMDs
- Heat the solder (for 2-3 seconds) at each terminal of the chip. By using a solder wick and a slight horizontal force, small components can be removed with the soldering iron. They can also be removed with a solder sucker (see Fig. 4.1A)

DISMOUNTING

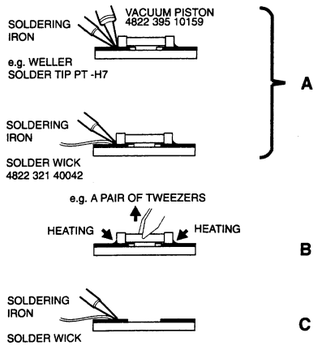


Fig. 4.1

- While holding the SMD with a pair of tweezers, take it off gently using the soldering iron's heat applied to each terminal (see Fig. 4.1 B).
- Remove the excess solder on the solder lands by means of a solder wick or a solder sucker (see Fig. 4.1C).

1.3 Caution on removal
- When handling the soldering iron, use suitable pressure and be careful.
- When removing the chip, do not use undue force with the pair of tweezers.
- The soldering iron to be used (approx. 30 W) should preferably be equipped with a thermal control (soldering temperature: 225 to 250 °C).
- The chip, once removed, must never be reused.

1.4 Attachment of SMDs
- Locate the SMD on the solder lands by means of tweezers and solder the component on one side. Ensure that the component is positioned correctly on the solder lands (see Fig. 4.2A).
- Next complete the soldering of the terminals of the component (see Fig. 4.2B).

MOUNTING

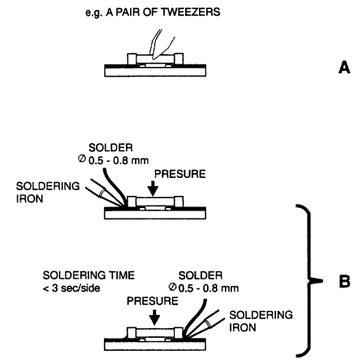


Fig. 4.2

2. Caution when attaching SMDs

- When soldering the SMD terminals, do not touch them directly with the soldering iron. The soldering should be done as quickly as possible, care must be taken to avoid damage to the terminals of the SMDs themselves.
- Keep the SMD's body in contact with the printed board when soldering.
- The soldering iron to be used (approx. 30 W) should preferably be equipped with a thermal control (soldering temperature: 225 to 250 °C).
- Soldering should not be done outside the solder land.
- Soldering flux (of rosin) may be used, but should not be acidic.
- After soldering, let the SMD cool down gradually at room temperature.
- The quantity of solder must be proportional to the size of the solder land. If the quantity is too great, the SMD might crack or the solder lands might be torn loose from the printed board (see Fig. 4.3).

EXAMPLES

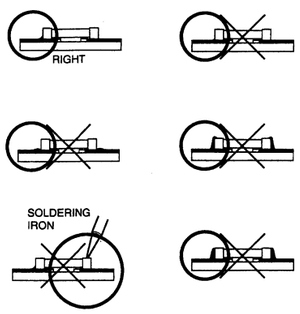
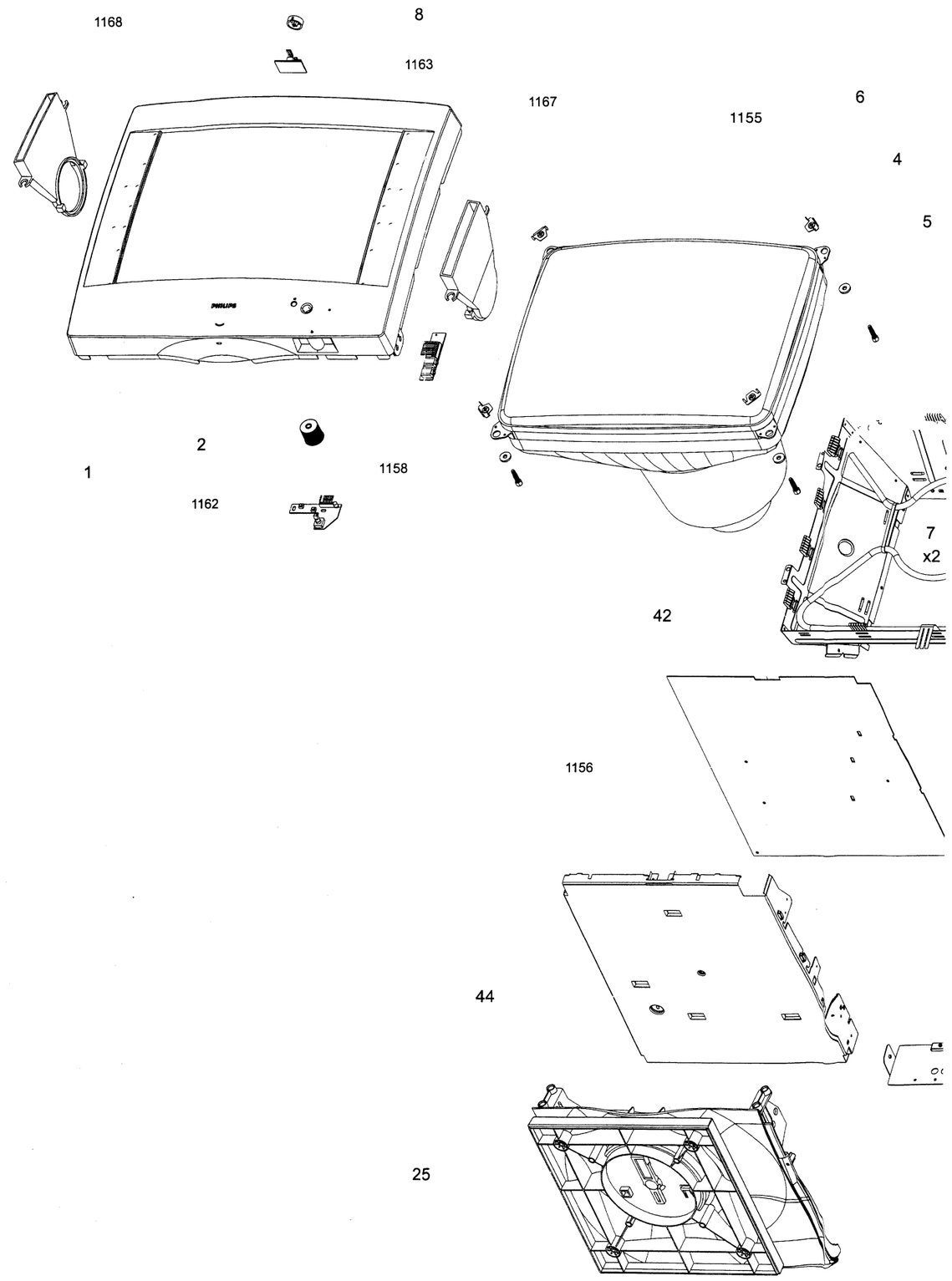
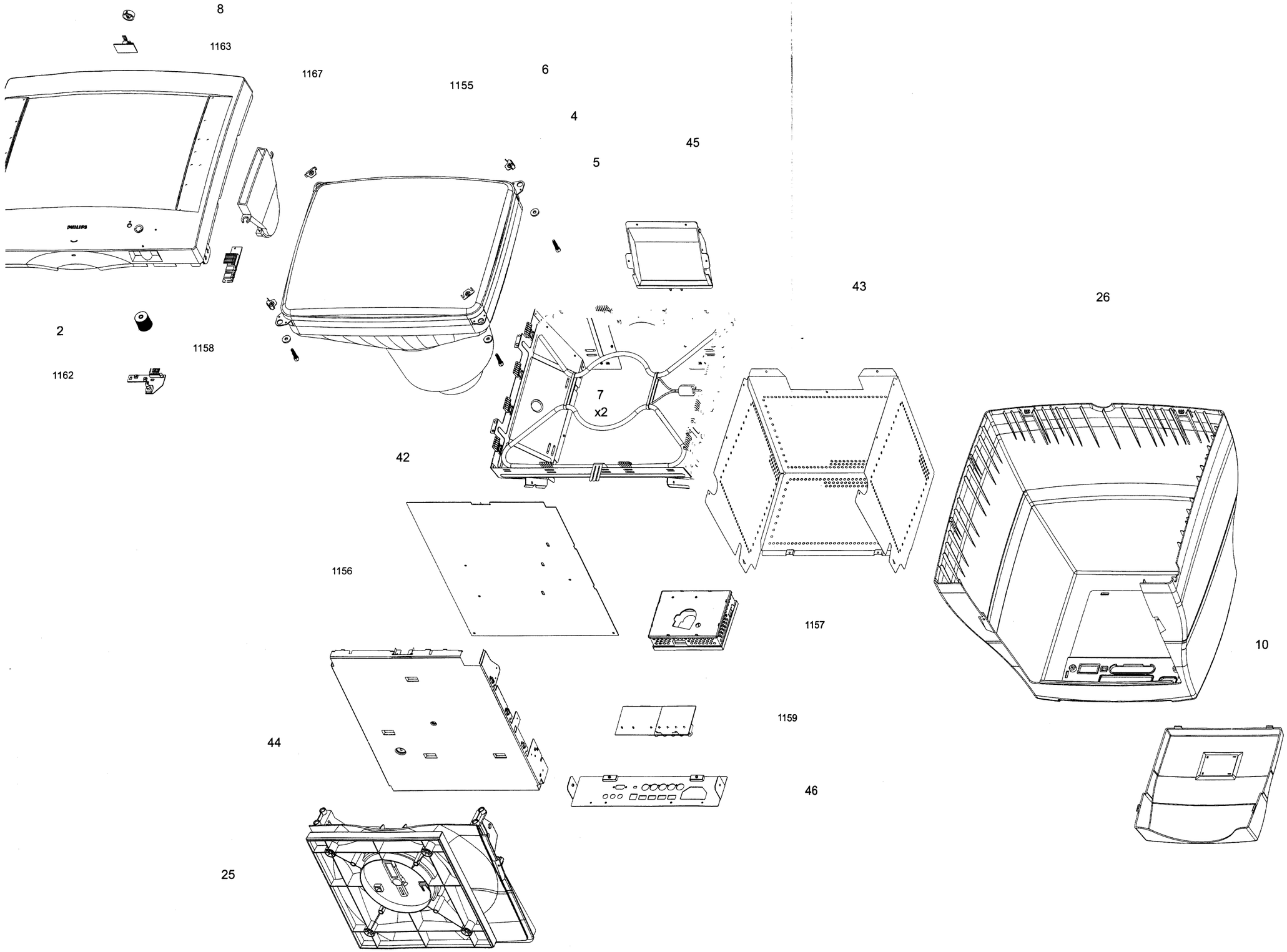


Fig. 4.3



Exploded View



Spare parts list

Parts indicated on exploded view: Model: 19A580BQ/74C

1	3138 107 94230	FRONT CABINET ASSY
	3138 104 39310	LENS
	3138 104 39320	FUNCTION KNOB
	4822 816 11141	SPEAKER PANEL (R)
	3138 104 38260	LOCKER
2	3138 104 39300	ROTARY KNOB
4	3138 101 63950	CRT MOUNTING WASHER
5	3138 100 41180	SCREW-CRT (TAP TITE SCREW W/WASHER)
6	3138 101 64480	PLATE-CRT
8	3138 104 39380	POWER KNOB
10	3138 107 94440	CABLE COVER ASS'Y
	3138 104 39330	CABLE COVER
	3138 104 40990	NAME PLATE
25	3138 107 94240	PEDESTAL ASSY
	3138 104 39280	BOTTOM
	3138 104 38270	SLIDER
	3138 104 39290	BASE - PEDESTAL
26	3138 104 39270	BACK COVER
1155▲	4822 131 11275	CRT M46LLQ683X01 (S)
1156	3138 128 62000	MAIN PCB ASSY
1157	3138 128 62480	VIDEO PCB ASSY
1158	3138 128 59270	EARPHONE PCB ASSY
1162	3138 128 59310	ENCODER PCB ASSY
1163	3138 128 59320	DC POWER SWITCH PCB ASSY
1167	3138 128 63030	SPEAKER ASSY
1168	3138 128 63030	SPEAKER ASSY

Various

1166▲	3138 128 77960	DEGAUSSING COIL ASSY
	4822 701 20292	TAPPING SCREW WITH WASHER
	3138 105 35110	D.F.U
	3138 105 35200	QUICK SET UP GUIDE
	4822 600 10409	P.E. BAG (for DFU)
	3138 106 51130	CARTON
	3138 106 51100	CUSHION TOP-L
	3138 106 51110	CUSHION TOP-R
	3138 106 51120	CUSHION BOTTOM
	4822 701 13753	P.E. BAG (for SET)

Accessories

	4822 320 12215	AUDIO CABLE
	4822 320 12216	MICROPHONE CABLE
	4822 265 11089	VGA ADAPTOR HD15/DB15 (MAC ADAPTOR)
	3138 117 01000	CD-ROM COLORIFIC
1151▲	4822 321 11283	MAINS CORD
1152	4822 320 12217	I/F CABLE

1156 Main panel

Various

1156	3138 128 62000	MAIN PCB ASSY 3774
	4822 492 71337	SPRING (FUSE HOLDER)
	4822 701 20292	TAPPING SCREW WITH WASHER
	5322 390 20011	VET SILIC.P4 20GR
1101▲	4822 070 34002	FUSE, 218004.(4A)
1102▲	4822 280 70378	RELAY 2P 12V/60MA OMI-SS212 B
1109	3138 128 78430	AC INLET ASSY
1114	4822 265 30891	2 P.
1202	4822 242 10836	12.000 000 MHz
1203	4822 267 10703	2P MALE
1211	4822 267 10696	14P MALE (62511B)
1212	4822 267 10697	7P WAFER (63576)
1213	4822 267 10698	3P MALE (61143B)
1215	4822 267 10704	8P FEMALE
1217	4822 267 10699	9P WAFER (63578)
1218	4822 265 11118	CONNECTOR 2P MALE
1221	4822 265 11175	R.C.A. JACK
	4822 492 62076	FOR TRANSISTORS
	4822 466 93161	INSULATION PLATE
	4822 466 92891	INSULATING PLATE
	5322 390 20011	VET SILIC.P4 20GR
1263	3138 128 63080	EEPROM ASSEMBLY (7201)
1504	4822 265 31231	3 P MALE

⊣⊢

2104	4822 121 70446	220nF 20% 250V
2105	4822 126 14088	2.2nF 20% 250V
2106	4822 126 14088	2.2nF 20% 250V
2107	5322 121 44212	1µF 10% 275B
2111	4822 121 43641	470nF 5% 400V
2112	4822 121 43699	220nF 100V
2113	4822 121 43699	220nF 100V
2114	4822 121 43696	100nF 100V
2115	4822 121 43696	100nF 100V
2116	5322 122 32531	100pF 5% 50V
2117	4822 126 10453	50V
2118	4822 122 30057	2.7nF 10% 100V
2119	4822 124 22669	1µF 20% 50V
2120	4822 124 22669	1µF 20% 50V
2121	4822 121 43696	100nF 100V
2122	4822 126 13469	330pF 10% Y5B 2KV
2123	4822 124 11517	450V 100U 20%
2124	4822 121 43696	100nF 100V
2125	4822 121 70357	22nF 10% 630V
2126	4822 121 70386	47nF 10% 250V
2127	4822 124 81186	47U 20% 20%
2128	4822 126 13196	CER2 **SMD** 25V 100N PM10 R
2129	4822 124 12112	1000µF 20% 10V
2130	4822 124 40849	330µF 20% 16V
2132	4822 124 12112	1000µF 20% 10V
2134	4822 124 12113	3300µF 20% 10V
2138▲	4822 126 14088	2.2nF 20% 250V
2141	4822 124 22669	1µF 20% 50V
2142	4822 126 13606	10N 2% 100V
2143	4822 124 40239	0.47µF 20% 63V
2146	4822 126 13196	CER2 **SMD** 25V 100N PM10 R
2147	5322 122 32331	1nF 10% 100V
2148	4822 121 43696	100nF 100V
2149	4822 121 43913	470nF 10% 100V
2150	5322 122 32311	470pF 10% 100V
2151	5322 122 32311	470pF 10% 100V
2154	4822 124 42145	100µF 20% 25V
2157	4822 121 43908	47nF 10% 250V
2159	4822 121 43699	220nF 100V
2160	4822 126 13196	CER2 **SMD** 25V 100N PM10 R
2161	4822 122 33342	33nF 10% 63V
2163	4822 121 43908	47nF 10% 250V
2164	4822 121 43364	10nF 10% 400V
2165	4822 121 43699	220nF 100V
2166	4822 121 43696	100nF 100V
2167	4822 124 42359	47µF 100V
2168	4822 124 42149	220µF 20% 25V
2169	4822 124 42145	100µF 20% 25V
2170	4822 126 11103	10nF 5% 50V
2171	4822 121 43696	100nF 100V
2172▲	4822 126 14088	2.2nF 20% 250V
2173	4822 126 13196	CER2 **SMD** 25V 100N PM10 R
2181	4822 124 11941	100µF 20% 250V
2182	4822 124 11941	100µF 20% 250V
2185	4822 124 12034	220µF 20% 100V
2186	4822 122 32899	100pF 10%B 500V
2187	4822 124 11942	2200µF 20% 25V
2188	4822 122 32899	100pF 10%B 500V
2189	4822 124 11943	1000µF 20% 25V
2190	4822 122 32899	100pF 10%B 500V
2191	4822 124 81285	2200µF 20% 16V
2192	4822 124 11942	2200µF 20% 25V
2193	4822 124 81131	330µF 20% 16V
2194	4822 124 42199	22µF 20% 50V
2195	4822 124 40207	100µF 20% 25V
2196	4822 124 22669	1µF 20% 50V
2197	5322 122 31866	6.8nF 10% 63V
2198	5322 122 32336	560pF 10% 100V
2201	4822 121 43696	100nF 100V
2202	5322 122 32143	22pF 100V
2203	5322 122 32143	22pF 100V
2214	4822 124 23539	10µF 20% 50V
2218	5322 124 41817	220µF 16V
2219	5322 122 32659	33pF 5% 50V
2220	5322 122 32659	33pF 5% 50V
2221	4822 124 22681	47µF 20% 16V
2222	4822 122 33575	220pF 5% 50V
2233	4822 124 23539	10µF 20% 50V
2234	5322 122 32658	22pF 5% 50V
2236	5322 122 32658	22pF 5% 50V
2239	4822 124 22681	47µF 20% 16V
2244	4822 124 22686	10µF 16V
2245	4822 126 13196	CER2 **SMD** 25V 100N PM10 R
2252	4822 122 33177	10nF 20% 50V
2253	4822 121 43699	220nF 100V
2254	4822 122 33177	10nF 20% 50V
2277	4822 124 23441	10µF 20% 50V
2281	5322 126 10184	680P 5% 50V.
2282	5322 126 10184	680P 5% 50V.
2283	4822 121 43913	470nF 10% 100V
2284	4822 121 43913	470nF 10% 100V
2285	4822 124 22678	100µF 20% 16V
2286	4822 124 22686	10µF 16V
2287	4822 122 33342	33nF 10% 63V
2288	4822 122 33342	33nF 10% 63V
2289	4822 122 32646	5.6nF 10% 50V
2290	4822 122 32646	5.6nF 10% 50V
2291	4822 124 12072	2.2µF 20% 50V
2292	4822 124 40763	2.2µF 100 V
2293	5322 122 32052	680pF 10% 100V
2294	5322 122 32052	680pF 10% 100V
2295	4822 121 43696	100nF 100V
2296	4822 121 43696	100nF 100V
2297	4822 124 42172	1000µF 16V
2305	4822 124 22681	47µF 20% 16V
2310	5322 122 32452	47pF 5% 63V
2311	5322 122 32452	47pF 5% 63V
2316	4822 126 13561	220nF 10% 16V
2317	4822 126 13196	CER2 **SMD** 25V 100N PM10 R
2325	4822 124 80132	47µF 20% 25V
2326	4822 124 42136	10µF 25V
2331	4822 126 13196	CER2 **SMD** 25V 100N PM10 R
2332	5322 122 32531	100pF 5% 50V
2333	5322 122 32531	100pF 5% 50V
2401	4822 124 22678	100µF 20% 16V
2403	4822 121 10705	47nF 5% 100V
2404	4822 121 10705	47nF 5% 100V
2405	4822 121 43513	100nF 100V
2406	4822 124 23539	10µF 20% 50V
2407	4822 121 43696	100nF 100V
2408	5322 122 32531	100pF 5% 50V
2409	4822 121 43695	47nF 10% 100V
2410	4822 121 70439	2.2nF 5% 100V
2411	4822 126 13606	10N 2% 100V
2412	4822 126 12104	12nF 5% 63V
2416	5322 122 32654	22nF 10% 63V
2425	4822 124 23539	10µF 20% 50V
2430	5322 122 32531	100pF 5% 50V
2431	4822 126 13196	CER2 **SMD** 25V 100N PM10 R
2432	4822 124 22669	1µF 20% 50V
2433	4822 124 40242	1µF 20% 63V
2434	4822 124 23539	10µF 20% 50V
2437	4822 122 33177	10nF 20% 50V
2438	4822 124 22669	1µF 20% 50V
2439	4822 124 40242	1µF 20% 63V
2440	4822 124 40246	4.7µF 20% 63V
2443	4822 124 23539	10µF 20% 50V
2444	4822 124 40242	1µF 20% 63V
2450	4822 124 40246	4.7µF 20% 63V
2453	4822 124 23441	10µF 20% 50V
2456	4822 124 23539	10µF 20% 50V
2457	4822 124 23539	10µF 20% 50V
2460	4822 124 23539	10µF 20% 50V
2467	4822 124 80132	47µF 20% 25V
2468	4822 122 33177	10nF 20% 50V
2472	4822 126 13196	CER2 **SMD** 25V 100N PM10 R
2473	4822 121 43916	330nF 10% 250V
2474	4822 124 22681	47µF 20% 16V
2477	4822 124 23539	10µF 20% 50V
2480	4822 124 80132	47µF 20% 25V
2486	5322 122 32448	10pF 5% 50V
2487	5322 122 32452	47pF 5% 63V
2488	5322 126 10184	680P 5% 50V.
2489	5322 126 10184	680P 5% 50V.
2490	4822 124 40207	100µF 20% 25V
2491	4822 124 23539	10µF 20% 50V
2492	5322 122 32654	22nF 10% 63V
2493	4822 124 80132	47µF 20% 25V
2501	4822 124 42144	470µF 63V
2502	4822 124 22336	100µF 20% 40V
2503	4822 126 14106	220pF 5% 50V
2504	4822 121 10706	22nF 5% 100V
2509	4822 121 43513	100nF 100V
2510	4822 124 42144	470µF 63V
2511	5322 116 80853	560pF 5% 63V
2513	5322 116 80853	560pF 5% 63V
2519	4822 124 23539	10µF 20% 50V
2521	4822 124 22681	47µF 20% 16V
2526	4822 121 70444	47nF 250V
2527	4822 124 22675	1µF 20% 160V
2529	4822 126 13035	220pF 10% 2KV
2530	4822 126 13035	220pF 10% 2KV
2531	4822 121 43364	10nF 10% 400V
2532	4822 121 70147	3.9nF 5% 1.6KV
2536	4822 124 22681	47µF 20% 16V
2537	4822 121 43918	100nF 10% 400V
2538	4822 124 80834	100µF 20% 250V
2539	4822 126 13249	150pF 10% Y5P 500V
2541	4822 124 22681	47µF 20% 16V
2542	4822 124 22681	47µF 20% 16V
2554	4822 121 42004	10nF 10% 400V
2555	4822 124 80276	10µF 20% 25V
2556	4822 121 43696	100nF 100V
2557	4822 124 42145	100µF 20% 25V
2558	4822 124 42145	100µF 20% 25V
2559	4822 126 13196	CER2 **SMD** 25V 100N PM10 R
2581	4822 124 23539	10µF 20% 50V
2582	4822 126 13196	CER2 **SMD** 25V 100N PM10 R
2583	4822 124 22681	47µF 20% 16V
2590	4822 126 13196	CER2 **SMD** 25V 100N PM10 R
2593	4822 124 80132	47µF 20% 25V
2595	4822 124 80132	47µF 20% 25V
2596	4822 124 80276	10µF 20% 25V
2601	4822 124 42199	22µF 20% 50V
2602	4822 121 43696	100nF 100V
2603	4822 124 22669	1µF 20% 50V
2604	4822 126 10453	50V
2605	4822 121 70162	10nF 5% 400V
2606	4822 122 33177	10nF 20% 50V
2607	5322 122 32531	100pF 5% 50V
2608	5322 122 32331	1nF 10% 100V
2609	4822 126 10453	50V
2611	4822 126 13196	CER2 **SMD** 25V 100N PM10 R
2614	4822 122 33177	10nF 20% 50V
2618	4822 121 43697	330nF 10% 100V
2619	4822 124 42357	33µF 25V
2623	4822 124 22681	47µF 20% 16V
2627	4822 124 42161	33µF 20% 250V
2630	4822 121 40336	47nF 10% 250V
2631	4822 126 11254	330pF 10% 2KV
2632	4822 124 42161	33µF 20% 250V
2633	4822 121 70492	2.2nF 5% 630V
2634	4822 121 70492	2.2nF 5% 630V
2636	4822 124 80132	47µF 20% 25V
2639	4822 121 70439	2.2nF 5% 100V
2641	4822 121 10706	22nF 5% 100V
2642	4822 121 70659	1.8µF 5% 100V
2645	4822 126 13134	1nF 10% 1KV
2646	4822 121 40336	47nF 10% 250V
2648	4822 124 41659	4.7µF 20% 25V
2651	4822 122 50117	100pF 2KV
2652	4822 126 12095	220pF 10% 2KV
2653	4822 126 13134	1nF 10% 1KV
2654	4822 126 13134	1nF 10% 1KV
2656	4822 126 12651	10nF 20% 2K
2657	4822 126 12651	10nF 20% 2K
2660	4822 126 13196	CER2 **SMD** 25V 100N PM10 R
2661	5322 122 32531	100pF 5% 50V
2662	4822 124 80132	47µF 20% 25V
2665	4822 124 41659	4.7µF 20% 25V
2671	4822 121 10707	1.2µF 5% 400V
2672	4822 121 70203	680pF 250V
2673	4822 121 43681	330pF 250V
2674	4822 121 70411	220pF 5% 250V
2675	4822 121 70598	82nF 5% 400V
2681	4822 121 70241	120pF 5% 250V
2682	4822 121 70598	82nF 5% 400V

2683	4822 121 70598	82nF 5% 400V
2901	4822 121 40336	47nF 10% 250V

3080	4822 051 20008	0Ω JUMP. (**SMD**)
3081	4822 051 20008	0Ω JUMP. (**SMD**)
3082	4822 051 20008	0Ω JUMP. (**SMD**)
3083	4822 051 20008	0Ω JUMP. (**SMD**)
3084	4822 051 20008	0Ω JUMP. (**SMD**)
3085	4822 051 20008	0Ω JUMP. (**SMD**)
3086	4822 051 20008	0Ω JUMP. (**SMD**)
3087	4822 051 20008	0Ω JUMP. (**SMD**)
3088	4822 051 20008	0Ω JUMP. (**SMD**)
3089	4822 051 20008	0Ω JUMP. (**SMD**)
3090	4822 051 20008	0Ω JUMP. (**SMD**)
3092	4822 051 20008	0Ω JUMP. (**SMD**)
3093	4822 051 20008	0Ω JUMP. (**SMD**)
3101	4822 053 21514	510k 5% 0.5W
3102	4822 116 30469	5Ω 15%
3106	4822 050 21205	1M2 1% 0.6W
3107	4822 050 23604	360k 1% 0.6W
3108	4822 116 52271	33k 5% 0.5W
3109	4822 051 53904	390k 1% 0.125W
3110	4822 051 53904	390k 1% 0.125W
3111	4822 050 13304	330k 1% 0.4W
3112	4822 051 20105	1M 5% 0.1W
3113	4822 050 24708	4Ω7 1% 0.6W
3114	4822 050 23902	3k9 1% 0.6W
3115	4822 116 52207	1k2 5% 0.5W
3116	4822 117 12179	0Ω1 5% 1W
3117	4822 050 24703	47k 1% 0.6W
3118	4822 050 28202	8k2 1% 0.6W
3119	4822 050 12702	2k7 1% 0.4W
3120	4822 050 22003	20k 1% 0.6W
3121▲	4822 052 11279	27Ω 5% 0.5W
3122	4822 050 22203	22k 1% 0.6W
3124	4822 117 12669	1k 5% 7W
3125	4822 052 10133	13k 5% 0.33W
3126	4822 050 12203	22k 1% 0.4W
3127	4822 050 24704	470k 1% 0.6W
3128	4822 050 24704	470k 1% 0.6W
3129	4822 050 29104	910k 1% 0.6W
3130	4822 050 29104	910k 1% 0.6W
3136	4822 050 21004	100k 1% 0.6W
3137	4822 050 24708	4Ω7 1% 0.6W

3139	4822 050 11002	1k 1% 0.4W
3140	4822 050 23301	330Ω 1% 0.6W
3141	4822 050 21501	150Ω 1% 0.6W
3142	4822 050 11002	1k 1% 0.4W
3143	4822 050 23901	390Ω 1% 0.6W
3144	4822 116 52289	5k6 5% 0.5W
3145	4822 050 15601	560Ω 1% 0.4W
3146	4822 050 21003	10k 1% 0.6W
3147	4822 050 24702	4k7 1% 0.6W
3148	4822 117 10833	10k 1% 0.1W
3149	4822 117 10833	10k 1% 0.1W
3150	4822 050 21004	100k 1% 0.6W
3151	4822 050 24703	47k 1% 0.6W
3152	4822 050 22709	27Ω 1% 0.6W
3153	4822 116 81849	220k 5%
3154	4822 116 52271	33k 5% 0.5W
3155	4822 050 11002	1k 1% 0.4W
3156	4822 117 12672	0Ω22 55 2W
3157	4822 116 83633	15k 5%
3158	4822 117 10833	10k 1% 0.1W
3159	4822 051 20684	680k 5% 0.1W
3160	4822 050 22709	27Ω 1% 0.6W
3161	4822 050 21003	10k 1% 0.6W
3162	4822 050 24702	4k7 1% 0.6W
3163	4822 116 83633	15k 5%
3166	4822 050 22709	27Ω 1% 0.6W
3168	4822 050 24702	4k7 1% 0.6W
3169	4822 117 12671	0Ω33 5% 5W
3170	4822 053 10108	1Ω 5% 1W
3171	4822 117 10834	47k 1% 0.1W
3172	4822 050 21003	10k 1% 0.6W
3173	4822 117 10833	10k 1% 0.1W
3174	4822 050 22704	270k 1% 0.6W
3175	4822 050 24703	47k 1% 0.6W
3176	4822 050 21502	1k5 1% 0.6W
3181	4822 050 21204	120k 1% 0.6W
3182	4822 050 24703	47k 1% 0.6W
3183	4822 050 21808	1Ω8 1% 0.6W
3188	4822 117 10834	47k 1% 0.1W
3189	4822 050 24702	4k7 1% 0.6W
3190	4822 051 20223	22k 5% 0.1W
3191	4822 050 21001	100Ω 1% 0.6W
3192	4822 050 21204	120k 1% 0.6W
3194	4822 101 10927	470Ω
3195	4822 050 21502	1k5 1% 0.6W
3196	4822 051 20682	6k8 5% 0.1W
3197	4822 116 80678	10k 1%
3201	4822 050 21003	10k 1% 0.6W
3202	4822 050 21003	10k 1% 0.6W
3203	4822 050 23302	3k3 1% 0.6W
3204	4822 051 20332	3k3 5% 0.1W
3205	4822 117 10833	10k 1% 0.1W
3206	4822 050 21001	100Ω 1% 0.6W
3207	4822 050 21001	100Ω 1% 0.6W
3212	4822 050 24702	4k7 1% 0.6W
3213	4822 050 21001	100Ω 1% 0.6W
3214	4822 051 20102	1k 5% 0.1W
3215	4822 117 11449	2k2 1% 0.1W
3216	4822 051 20472	4k7 5% 0.1W
3220	4822 117 10834	47k 1% 0.1W
3221	4822 050 22201	220Ω 1% 0.6W
3222	4822 050 22201	220Ω 1% 0.6W
3223	4822 050 21003	10k 1% 0.6W
3224	4822 050 21003	10k 1% 0.6W
3225	4822 050 21003	10k 1% 0.6W
3226	4822 050 21003	10k 1% 0.6W
3227	4822 050 21003	10k 1% 0.6W
3228	4822 050 24702	4k7 1% 0.6W
3229	4822 051 20102	1k 5% 0.1W
3230	4822 050 21001	100Ω 1% 0.6W
3231	4822 050 21001	100Ω 1% 0.6W
3232	4822 117 11449	2k2 1% 0.1W
3233	4822 050 21002	1k 1% 0.6W
3234	4822 051 20332	3k3 5% 0.1W
3235	4822 051 20101	100Ω 5% 0.1W
3236	4822 051 20332	3k3 5% 0.1W
3237	4822 050 21001	100Ω 1% 0.6W
3238	4822 051 20472	4k7 5% 0.1W
3239	4822 052 10478	4Ω7 5% 0.33W
3240	4822 050 21001	100Ω 1% 0.6W
3241	4822 050 21001	100Ω 1% 0.6W
3242	4822 050 21001	100Ω 1% 0.6W
3243	4822 050 21001	100Ω 1% 0.6W
3244	4822 051 20822	8k2 5% 0.1W
3245	4822 050 22203	22k 1% 0.6W
3246	4822 051 20683	68k 5% 0.1W
3247	4822 050 21001	100Ω 1% 0.6W
3248	4822 051 20472	4k7 5% 0.1W
3249	4822 051 20472	4k7 5% 0.1W
3250	4822 050 21003	10k 1% 0.6W
3251	4822 050 24702	4k7 1% 0.6W
3252	4822 050 21001	100Ω 1% 0.6W
3253	4822 050 24702	4k7 1% 0.6W
3254	4822 050 21001	100Ω 1% 0.6W
3255	4822 050 11503	15k 1% 0.4W
3256	4822 050 24702	4k7 1% 0.6W
3257	4822 051 20271	270Ω 5% 0.1W
3258	4822 051 20121	120Ω 5% 0.1W
3259	4822 051 20332	3k3 5% 0.1W
3260	4822 050 22203	22k 1% 0.6W
3261	4822 050 21001	100Ω 1% 0.6W
3262	4822 050 21001	100Ω 1% 0.6W
3263	4822 050 21001	100Ω 1% 0.6W
3264	4822 050 21001	100Ω 1% 0.6W
3281	4822 050 16802	6k8 1% 0.4W
3282	4822 050 16802	6k8 1% 0.4W
3283	4822 051 20822	8k2 5% 0.1W
3284	4822 050 28202	8k2 1% 0.6W
3285	4822 051 20101	100Ω 5% 0.1W
3286	4822 051 20101	100Ω 5% 0.1W
3287	4822 050 12703	27k 1% 0.4W
3288	4822 050 12703	27k 1% 0.4W
3289	4822 050 22203	22k 1% 0.6W
3290	4822 050 22203	22k 1% 0.6W
3291	4822 117 10833	10k 1% 0.1W
3292	4822 117 10833	10k 1% 0.1W
3293	4822 050 23302	3k3 1% 0.6W
3294	4822 050 23302	3k3 1% 0.6W
3295	4822 050 21009	10Ω 1% 0.6W
3296	4822 050 21009	10Ω 1% 0.6W
3297	4822 050 15603	56k 1% 0.4W
3298	4822 050 15603	56k 1% 0.4W
3299▲	4822 052 10478	4Ω7 5% 0.33W
3301	4822 050 11002	1k 1% 0.4W
3302	4822 050 11002	1k 1% 0.4W
3303	4822 050 24701	470Ω 1% 0.6W
3304	4822 050 11002	1k 1% 0.4W
3305▲	4822 052 10478	4Ω7 5% 0.33W
3306	4822 050 24701	470Ω 1% 0.6W
3307	4822 050 11002	1k 1% 0.4W
3308	4822 051 20472	4k7 5% 0.1W
3309	4822 051 20472	4k7 5% 0.1W
3310	4822 117 10833	10k 1% 0.1W
3311	4822 117 10833	10k 1% 0.1W
3312	4822 117 11449	2k2 1% 0.1W
3313	4822 117 11449	2k2 1% 0.1W
3316	4822 051 20472	4k7 5% 0.1W
3317	4822 050 24702	4k7 1% 0.6W
3318	4822 051 20154	150k 5% 0.1W
3321	4822 050 24702	4k7 1% 0.6W
3323	4822 051 20471	470Ω 5% 0.1W
3324	4822 117 11503	220Ω 1% 0.1W
3325	4822 050 24708	4Ω7 1% 0.6W
3326	4822 051 20393	39k 5% 0.1W
3327	5322 100 11544	220k 30%lin 0.1W
3328	4822 117 10833	10k 1% 0.1W
3329	4822 117 10833	10k 1% 0.1W
3330	4822 051 20393	39k 5% 0.1W
3332	4822 117 10834	47k 1% 0.1W
3333	4822 117 10834	47k 1% 0.1W
3334	4822 051 20101	100Ω 5% 0.1W
3335	4822 051 20101	100Ω 5% 0.1W
3336	4822 051 20101	100Ω 5% 0.1W
3401	4822 050 24701	470Ω 1% 0.6W
3402	4822 051 20472	4k7 5% 0.1W
3403	4822 050 24702	4k7 1% 0.6W
3404	4822 051 20472	4k7 5% 0.1W
3405	4822 117 11449	2k2 1% 0.1W
3406	4822 050 23301	330Ω 1% 0.6W
3407	4822 051 53904	390k 1% 0.125W
3408	4822 050 24701	470Ω 1% 0.6W
3409	4822 050 21203	12k 1% 0.6W
3410	4822 050 21242	1k24 1% 0.6W
3411	4822 050 27501	750Ω 1% 0.6W
3412	4822 050 28202	8k2 1% 0.6W
3414	4822 050 12203	22k 1% 0.4W
3415	4822 117 11449	2k2 1% 0.1W
3416	4822 117 11383	12k 1% 0.1W
3417	4822 111 50522	33k 5% 1/6W
3423	4822 117 11449	2k2 1% 0.1W
3424▲	4822 052 10478	4Ω7 5% 0.33W
3425	4822 050 21203	12k 1% 0.6W
3426	4822 050 12703	27k 1% 0.4W
3427	4822 050 23902	3k9 1% 0.6W
3428	4822 117 12602	750k 5% 0.1W
3429	4822 117 10833	10k 1% 0.1W
3430	4822 117 11449	2k2 1% 0.1W
3431	4822 051 20104	100k 5% 0.1W
3432	4822 051 20563	56k 5% 0.1W
3433	4822 051 20563	56k 5% 0.1W
3434	4822 116 82046	2k2 5% 1/6W
3435	4822 051 20561	560Ω 5% 0.1W
3436	4822 051 20563	56k 5% 0.1W
3437	4822 117 11449	2k2 1% 0.1W
3438	4822 050 13903	39k 1% 0.4W
3439	4822 050 23903	39k 1% 0.6W
3440	4822 050 25603	56k 1% 0.6W
3441	4822 117 10833	10k 1% 0.1W
3442	4822 050 13903	39k 1% 0.4W
3443	4822 050 21204	120k 1% 0.6W
3444	4822 117 10965	18k 1% 0.1W
3445	4822 117 10833	10k 1% 0.1W
3446	4822 117 10833	10k 1% 0.1W
3447	4822 050 22202	2k2 1% 0.6W
3448	4822 051 20302	3k 5% 0.1W
3449	4822 117 10833	10k 1% 0.1W
3450	4822 050 21002	1k 1% 0.6W
3451	4822 051 20393	39k 5% 0.1W
3452	4822 117 10833	10k 1% 0.1W
3453	4822 050 21803	18k 1% 0.6W
3454	4822 117 10833	10k 1% 0.1W
3455	4822 051 20393	39k 5% 0.1W
3456	4822 051 20124	120k 5% 0.1W
3457	4822 050 21803	18k 1% 0.6W
3458	4822 117 10833	10k 1% 0.1W
3459	4822 051 20682	6k8 5% 0.1W
3460	4822 050 21202	1k2 1% 0.6W
3461	4822 050 24702	4k7 1% 0.6W
3462	4822 050 23903	39k 1% 0.6W
3463	4822 117 10833	10k 1% 0.1W
3464	4822 100 11319	4k7 30%lin 0.1W
3465	4822 050 21001	100Ω 1% 0.6W
3466	4822 051 20102	1k 5% 0.1W
3467▲	4822 052 10828	8Ω2 5% 0.33W
3468	4822 051 20332	3k3 5% 0.1W
3469	4822 050 23302	3k3 1% 0.6W
3470	4822 117 10834	47k 1% 0.1W
3471	4822 051 20101	100Ω 5% 0.1W
3472	4822 051 20472	4k7 5% 0.1W
3473▲	4822 052 10478	4Ω7 5% 0.33W
3474	4822 051 20472	4k7 5% 0.1W
3476	4822 117 10834	47k 1% 0.1W
3477	4822 051 20472	4k7 5% 0.1W
3478	4822 051 20479	47Ω 5% 0.1W
3479	4822 050 22201	220Ω 1% 0.6W
3480	4822 117 10834	47k 1% 0.1W
3481	4822 050 26203	62k 1% 0.6W
3482	4822 050 21005	1M 1% 0.6W
3483	4822 050 21003	10k 1% 0.6W
3484	4822 050 12702	2k7 1% 0.4W
3485	4822 050 21504	150k 1% 0.6W
3486	4822 050 24701	470Ω 1% 0.6W
3487	4822 117 10833	10k 1% 0.1W
3488	4822 051 20479	47Ω 5% 0.1W
3489	4822 051 20332	3k3 5% 0.1W
3490	4822 051 20471	470Ω 5% 0.1W
3491	4822 050 24709	47Ω 1% 0.6W
3492	4822 111 50521	100k 5%
3493	4822 051 20224	220k 5% 0.1W
3495	4822 117 11383	12k 1% 0.1W
3496	4822 117 10833	10k 1% 0.1W
3497	4822 050 26803	68k 1% 0.6W
3498	4822 051 20102	1k 5% 0.1W
3499	4822 051 20008	0Ω JUMP. (**SMD**)
3501▲	4822 052 11228	2Ω2 5% 0.5W
3502	4822 050 22202	2k2 1% 0.6W
3503	4822 050 24701	470Ω 1% 0.6W
3504	4822 050 24701	470Ω 1% 0.6W
3505	4822 050 22202	2k2 1% 0.6W
3506	4822 050 21808	1Ω8 1% 0.6W
3507	4822 050 21808	1Ω8 1% 0.6W
3508	4822 050 24701	470Ω 1% 0.6W
3509	4822 050 23309	33Ω 1% 0.6W
3510▲	4822 052 11228	2Ω2 5% 0.5W
3511	4822 051 20223	22k 5% 0.1W
3512	4822 051 20332	3k3 5% 0.1W
3513	4822 050 13302	3k3 1% 0.4W
3517	4822 051 20472	4k7 5% 0.1W
3518	4822 051 20223	22k 5% 0.1W
3519	4822 050 22203	22k 1% 0.6W
3520▲	4822 052 10478	4Ω7 5% 0.33W
3521	4822 117 11449	2k2 1% 0.1W
3522	4822 050 24701	470Ω 1% 0.6W
3523	4822 117 10833	10k 1% 0.1W
3524	4822 050 24701	470Ω 1% 0.6W
3526	4822 050 21803	18k 1% 0.6W
3527▲	4822 052 11101	100Ω 5% 0.5W
3528	4822 117 12669	1k 5% 7W
3531	4822 053 12108	1Ω 5% 3W
3532	4822 050 26809	68Ω 1% 0.6W
3533	4822 050 21501	150Ω 1% 0.6W
3540▲	4822 052 10828	8Ω2 5% 0.33W
3541	4822 050 24709	47Ω 1% 0.6W
3542	4822 050 21003	10k 1% 0.6W
3543	4822 050 21202	1k2 1% 0.6W
3544▲	4822 052 11108	1Ω 5% 0.5W
3545	4822 117 10442	10Ω 5%
3546	4822 117 12941	33Ω 5% 7W
3548▲	4822 052 10108	1Ω 5% 0.33W
3549▲	4822 052 10108	1Ω 5% 0.33W
3550	4822 050 22201	220Ω 1% 0.6W
3551	4822 100 11141	10k 30%lin 0.1W
3552	4822 050 26801	680Ω 1% 0.6W
3554	4822 117 12942	150Ω 5% 7W
3555	4822 051 20562	5k6 5% 0.1W
3556	4822 117 10442	10Ω 5%
3557	4822 117 10753	12Ω 5% 0.5W
3558▲	4822 052 11279	27Ω 5% 0.5W
3559	4822 050 24701	470Ω 1% 0.6W
3560▲	4822 052 11279	27Ω 5% 0.5W
3562	4822 050 21203	12k 1% 0.6W
3563	4822 117 11383	12k 1% 0.1W
3564	4822 051 20102	1k 5% 0.1W
3566	4822 117 11383	12k 1% 0.1W
3567	4822 051 20101	100Ω 5% 0.1W
3568	4822 051 20101	100Ω 5% 0.1W
3569	4822 051 20101	100Ω 5% 0.1W
3570	4822 051 20101	100Ω 5% 0.1W
3571	4822 051 20101	100Ω 5% 0.1W
3572	4822 051 20101	100Ω 5% 0.1W
3573	4822 051 20101	100Ω 5% 0.1W
3574	4822 051 20101	100Ω 5% 0.1W
3575	4822 051 20101	100Ω 5% 0.1W
3576	4822 051 20101	100Ω 5% 0.1W
3577	4822 051 20101	100Ω 5% 0.1W
3578	4822 051 20101	100Ω 5% 0.1W
3580	4822 117 11449	2k2 1% 0.1W
3581	4822 050 21803	18k 1% 0.6W
3582	4822 050 21001	100Ω 1% 0.6W
3583	4822 050 21001	100Ω 1% 0.6W
3584	4822 050 21001	100Ω 1% 0.6W
3585	4822 050 21001	100Ω 1% 0.6W
3586	4822 050 21001	100Ω 1% 0.6W
3587	4822 116 82046	2k2 5% 1/6W
3588	4822 050 21001	100Ω 1% 0.6W
3589	4822 050 21001	100Ω 1% 0.6W
3591	4822 116 52289	5k6 5% 0.5W
3592	4822 050 21203	12k 1% 0.6W
3593▲	4822 052 11689	68Ω 5% 0.5W
3594	4822 050 21003	10k 1% 0.6W
3595▲	4822 052 11689	68Ω 5% 0.5W
3596	4822 050 24701	470Ω 1% 0.6W
3597	4822 050 22209	22Ω 1% 0.6W
3598	4822 050 11002	1k 1% 0.4W
3599	4822 051 20332	3k3 5% 0.1W
3600	4822 117 10834	47k 1% 0.1W
3601	4822 050 24702	4k7 1% 0.6W
3602	4822 050 21004	100k 1% 0.6W
3603	4822 050 21004	100k 1% 0.6W
3604	4822 050 28202	8k2 1% 0.6W

Spare parts list

3605	4822 050 22709	27Ω 1% 0.6W
3606	4822 116 82967	68k 0.125
3607	4822 117 12581	82k 5% 0.5W.
3608	4822 051 20154	150k 5% 0.1W
3609	4822 051 20472	4k7 5% 0.1W
3611	4822 117 12584	820Ω 1%
3612	4822 051 20302	3k 5% 0.1W
3613	4822 050 22201	220Ω 1% 0.6W
3614	4822 050 21803	18k 1% 0.6W
3615	4822 050 21803	18k 1% 0.6W
3616	4822 050 21003	10k 1% 0.6W
3617	4822 050 11002	1k 1% 0.4W
3618	4822 117 10834	47k 1% 0.1W
3619	4822 050 21004	100k 1% 0.6W
3620	4822 050 25603	56k 1% 0.6W
3621	4822 050 25103	51k 1% 0.6W
3622	4822 100 11213	22k 30%lin 0.1W
3623▲	4822 052 10478	4Ω7 5% 0.33W
3624	4822 051 20102	1k 5% 0.1W
3625	4822 050 22202	2k2 1% 0.6W
3626	4822 052 10478	4Ω7 5% 0.33W
3627	4822 050 21005	1M 1% 0.6W
3630	4822 053 21224	220k 5% 0.5W
3631	4822 117 11622	270k 5% 0.5W
3632	4822 117 11531	39Ω 5% 2W
3633	4822 050 21003	10k 1% 0.6W
3634▲	4822 052 11109	10Ω 5% 0.5W
3635	4822 050 24701	470Ω 1% 0.6W
3636▲	4822 052 11828	8Ω2 5% 0.5W
3637	4822 050 21001	100Ω 1% 0.6W
3638	4822 050 24701	470Ω 1% 0.6W
3639	4822 050 21003	10k 1% 0.6W
3640▲	4822 117 10442	10Ω 5%
3641	4822 050 21201	120Ω 1% 0.6W
3642	4822 050 18204	820k 1% 0.4W
3643	4822 050 26203	62k 1% 0.6W
3644	4822 100 11392	47k 30%lin 0.1W
3645	4822 053 21104	100k 5% 0.5W
3646	4822 117 11635	1k 0.5W
3647	4822 100 11585	22k 30%LIN 0.1W
3648	4822 117 10833	10k 1% 0.1W
3649	4822 050 22702	2k7 1% 0.6W
3650	4822 050 25602	5k6 1% 0.6W
3651	4822 053 21224	220k 5% 0.5W
3652	4822 111 50617	2k2 10% 0.5W
3653	4822 053 21104	100k 5% 0.5W
3654	4822 117 10833	10k 1% 0.1W
3655	4822 053 21155	1M5 5% 0.5W
3656	4822 053 21155	1M5 5% 0.5W
3657	4822 050 21502	1k5 1% 0.6W
3658	4822 050 23302	3k3 1% 0.6W
3659	4822 050 11002	1k 1% 0.4W
3660	4822 050 23903	39k 1% 0.6W
3661	4822 050 24701	470Ω 1% 0.6W
3662	4822 051 20223	22k 5% 0.1W
3663	4822 117 11445	240k 5% 0.1W
3664	4822 050 21505	1M5 1% 0.6W
3665	4822 117 10833	10k 1% 0.1W
3671	4822 051 20104	100k 5% 0.1W
3672	4822 051 20104	100k 5% 0.1W
3673	4822 051 20104	100k 5% 0.1W
3674	4822 051 20104	100k 5% 0.1W
3675	4822 051 20104	100k 5% 0.1W
3685	4822 050 22202	2k2 1% 0.6W
3686	4822 050 21003	10k 1% 0.6W
3687	4822 050 21003	10k 1% 0.6W
3688	4822 050 21003	10k 1% 0.6W
3689	4822 050 21003	10k 1% 0.6W
3690	4822 050 21003	10k 1% 0.6W
3904	4822 116 40144	12Ω
3907	4822 116 21237	1M A/100V
3912	4822 051 20472	4k7 5% 0.1W
3913	4822 117 11449	2k2 1% 0.1W
3914	4822 050 21009	10Ω 1% 0.6W

5101	4822 157 10292	14mH
5102	4822 157 10292	14mH
5111	3138 128 77810	PFC CHOKE
5113	4822 526 10522	IND FXD BEAD EMI 0.7U B
5136	3138 128 78010	USB TRANSFORMER
5161	4822 146 10732	DRIVER TANSFORMER
5162▲	3138 128 78000	POWER TRANSFORMER
5221	4822 157 53189	CHOKE COIL 5.0µH PM10
5506	4822 157 71509	6mH
5507	3138 128 78230	DRUM COIL 2mH
5522	4822 142 40349	H/DRV XFMR
5523	3138 128 77820	CENTERING TRANSFORMER
5525	4822 157 71372	CHOCK COIL 20µH
5526	3138 128 78450	LINEARITY COIL
5583	4822 152 20596	IND FXD SP0305 A 4U7 PM10 B
5632	4822 157 71372	CHOCK COIL 20µH
5638▲	3138 128 78760	LINE OUTPUT TRANSFORMER
5651	4822 146 10738	DAF TRANSFORMER
5826	4822 157 63218	DRUM COIL 10 mH

6101	4822 130 10741	GBU6J
6111	4822 130 80572	RGP30J
6112	5322 130 10709	BYM26C
6114	4822 130 80446	BAS32L
6115	4822 130 31607	RGP10D
6116	4822 130 34173	BZX79-B5V6
6130	4822 130 34488	BZX79-B11
6131	4822 130 34488	BZX79-B11
6132	4822 130 10742	UF4004
6133	4822 130 10742	UF4004
6134	4822 130 30621	1N4148
6135	5322 130 80282	P6KE180A
6136	4822 130 32343	BYV26C
6138	5322 130 81917	SB140
6139	5322 130 81917	SB140
6140	4822 130 32715	SB340
6141	4822 130 34173	BZX79-B5V6
6142	4822 130 30621	1N4148
6143	4822 130 30621	1N4148
6145	4822 130 80446	BAS32L
6146	4822 130 30862	BZX79-B9V1
6161	4822 130 34499	BZX79-B20
6162	4822 130 10742	UF4004
6163	4822 130 10742	UF4004
6167	4822 130 34499	BZX79-B20
6170	4822 130 10742	UF4004
6172	4822 130 10742	UF4004
6173	4822 130 10742	UF4004
6174	4822 130 10742	UF4004
6181	5322 130 10709	BYM26C
6182	4822 130 11113	31DF4-FC5
6183	4822 130 11113	31DF4-FC5
6184	4822 130 11113	31DF4-FC5
6186	4822 130 10835	UG4B
6188	4822 130 83909	BYW98-200RL
6189	4822 130 10742	UF4004
6190	4822 130 83909	BYW98-200RL
6191	4822 130 80446	BAS32L
6192	4822 130 31982	BYV27-100
6193	4822 130 30621	1N4148
6194	4822 130 30621	1N4148
6195	4822 130 31173	GP15D
6196	4822 130 80446	BAS32L
6197	4822 130 30621	1N4148
6201	5322 130 34337	BAV99
6202	4822 130 80446	BAS32L
6203	4822 130 80446	BAS32L
6220	4822 130 80446	BAS32L
6221	5322 130 31504	BZX79-B3V3
6243	4822 130 80446	BAS32L
6244	4822 130 80446	BAS32L
6255	4822 130 80446	BAS32L
6256	4822 130 30621	1N4148
6281	4822 130 30621	1N4148
6282	4822 130 30621	1N4148
6304	4822 130 30621	1N4148
6306	4822 130 30621	1N4148
6310	4822 130 80446	BAS32L
6311	4822 130 80446	BAS32L
6317	4822 130 80446	BAS32L
6318	4822 130 80446	BAS32L
6319	4822 051 10008	0R00 5% 0,25W
6401	4822 130 30621	1N4148
6425	4822 130 30621	1N4148
6473	4822 130 34328	BZX79-B30
6474	4822 130 80446	BAS32L
6485	4822 130 34233	BZX79-B5V1
6487	4822 130 80446	BAS32L
6491	4822 130 30621	1N4148
6493	4822 130 80446	BAS32L
6494	4822 130 30621	1N4148
6495	4822 130 30621	1N4148
6496	4822 130 30621	1N4148
6497	4822 130 30621	1N4148
6501	5322 130 31969	RGP15M
6511	4822 130 80446	BAS32L
6519	4822 130 80446	BAS32L
6526	4822 130 31607	RGP10D
6527	4822 130 42489	BYD33G
6531	5322 130 32184	BYV27-50
6534	4822 130 83812	BY459-1500
6535	4822 130 34197	BZX79-B12
6539	4822 130 11114	BYM26B
6542	4822 130 30621	1N4148
6548	4822 130 31607	RGP10D
6549	4822 130 31607	RGP10D
6601	4822 130 31607	RGP10D
6603	4822 130 80446	BAS32L
6605	4822 130 80446	BAS32L
6606	4822 130 30621	1N4148
6607	4822 130 30621	1N4148
6608	4822 130 80446	BAS32L
6611	4822 130 34233	BZX79-B5V1
6613	4822 130 80446	BAS32L
6617	4822 130 80446	BAS32L
6618	4822 130 80446	BAS32L
6620	4822 130 80446	BAS32L
6626	4822 130 31393	BYT52J
6632	4822 130 83128	EGP30G
6638	4822 130 30621	1N4148
6642	4822 130 34685	BZX79-B75
6650	4822 130 30621	1N4148
6655	4822 130 60815	BYV26E
6656	5322 130 32274	BY584
6657	5322 130 32274	BY584
6662	4822 130 34197	BZX79-B12
6675	4822 130 30621	1N4148
6676	4822 130 34233	BZX79-B5V1
6677	4822 130 30621	1N4148
6904	4822 130 31438	1N4001G

7111	4822 209 16121	L4981A
7112	4822 130 11117	STU14NA50
	5322 390 20011	VET SILIC.P4 20GR
7131	4822 209 15578	TOP202YAI
7132	4822 209 13061	L4940V5
7133	4822 130 40995	BD438
7134	4822 130 10829	MUN2211J
7144	4822 209 16097	L4990
7146	4822 209 70672	LM358N SEL.
7162	4822 130 10831	STP10NA40
7168	4822 130 10831	STP10NA40
	5322 390 20011	VET SILIC.P4 20GR
7172	4822 130 80908	CNX62A
7181	4822 209 81726	MC7812CT
	5322 390 20011	VET SILIC.P4 20GR
7186	4822 209 81397	TL431CLPST
7187	4822 130 10829	MUN2211J
7188	5322 130 60068	BC558C
7189	4822 209 81397	TL431CLPST
7201		This is an empty IC, please use item 1263 for spare parts ordering.
7202	5322 209 11566	PC74HC14P
7257	5322 130 60068	BC558C
7258	4822 130 44196	BC548C
7281	4822 130 44503	BC547C
7282	4822 130 44503	BC547C
7301	5322 209 11109	74HCT74N
7303	4822 130 44196	BC548C
7304	4822 130 10829	MUN2211J
7305	5322 130 42136	BC848C
7306	4822 130 41594	PH2369
7310	5322 130 42136	BC848C
7311	5322 130 42136	BC848C
7317	5322 130 42136	BC848C
7318	4822 209 73852	PMBT2369
7319	4822 209 73852	PMBT2369
7328	4822 130 44196	BC548C
7329	4822 130 44196	BC548C
7331	4822 209 15121	ST24LC21B1
7401	4822 209 15123	TDA4858
7402	5322 130 42136	BC848C
7426	4822 130 44196	BC548C
7430	5322 130 42136	BC848C
7431	4822 130 42513	BC858C
7443	4822 130 44196	BC548C
7444	4822 130 44196	BC548C
7445	4822 130 44196	BC548C
7446	4822 130 44196	BC548C
7447	4822 130 44196	BC548C
7448	4822 130 44196	BC548C
7449	4822 130 44196	BC548C
7450	4822 130 44196	BC548C
7451	4822 130 44196	BC548C
7452	4822 130 44196	BC548C
7453	4822 130 44196	BC548C
7454	4822 130 44196	BC548C
7455	4822 130 44196	BC548C
7456	4822 130 44196	BC548C
7466	4822 130 42513	BC858C
7467	4822 130 42513	BC858C
7468	4822 130 10829	MUN2211J
7470	4822 130 10829	MUN2211J
7471	5322 130 60068	BC558C
7472	4822 130 41646	BF423
7473	4822 130 41782	BF422
7486	5322 209 86234	NE5532N
7487	5322 130 60068	BC558C
7488	4822 130 41594	PH2369
7489	4822 130 10829	MUN2211J
7490	5322 130 60068	BC558C
7491	5322 209 61472	LM393M
7501	4822 209 90009	TDA8177
	4822 492 62076	FOR TRANSISTORS
	4822 466 11509	INSULATING PLATE
	5322 390 20011	VET SILIC.P4 20GR
7502	4822 130 44196	BC548C
7518	4822 130 44196	BC548C
7521	4822 130 44196	BC548C
7522	5322 130 60068	BC558C
7523	4822 130 63081	BSN254A
7532	4822 130 11116	BU2532AL
	4822 492 62076	FOR TRANSISTORS
	4822 466 93161	INSULATION PLATE
	4822 466 11509	INSULATING PLATE
	5322 390 20011	VET SILIC.P4 20GR
7540	4822 130 44121	BC338
7541	4822 130 44104	BC328
7543	4822 130 10788	MTP5P25
	5322 390 20011	VET SILIC.P4 20GR
7550	4822 130 63274	2SC2344E
7551	4822 130 63275	2SA1011E
7555	4822 209 70672	LM358N SEL.
7556	4822 130 40823	BD139
7557	4822 130 40824	BD140
7576	4822 209 16098	M62393P
7591	4822 209 70672	LM358N SEL.
7592	4822 130 41053	BC639
7593	4822 130 41087	BC638
7601	4822 209 33432	UC3842BN
7602	4822 209 70672	LM358N SEL.
7603	5322 130 42756	BC857C
7604	4822 130 44196	BC548C
7605	5322 130 42756	BC857C
7632	5322 130 63002	IRF640
7633	4822 130 63081	BSN254A
7634	4822 130 63445	MTP6N60
	5322 390 20011	VET SILIC.P4 20GR
7647	4822 130 44196	BC548C
7651	4822 130 70025	BUX87P
7652	4822 130 44196	BC548C
7653	4822 130 44196	BC548C
7671	5322 130 63002	IRF640
	5322 390 20011	VET SILIC.P4 20GR
7672	5322 130 63002	IRF640
	5322 390 20011	VET SILIC.P4 20GR
7673	5322 130 60684	IRF540
7674	5322 130 60684	IRF540
7675	5322 130 60684	IRF540
7681	4822 130 10829	MUN2211J
7682	4822 130 10829	MUN2211J
7683	4822 130 10829	MUN2211J
7684	4822 130 10829	MUN2211J
7685	4822 130 10829	MUN2211J
7708	4822 209 15329	CR6927
	5322 390 20011	VET SILIC.P4 20GR
7726	4822 209 33083	L7808CV
	5322 390 20011	VET SILIC.P4 20GR
7727	5322 209 85913	MC7912CT
	4822 526 10544	FERRITE BEAD TR-35 X1.3X6
7911	4822 130 44104	BC328
7912	4822 130 10829	MUN2211J

1157 Video panel

Various

1157	3138 128 62480	VIDEO PCB ASSY
	4822 701 20292	TAPPING SCREW WITH WASHER
	4822 701 20292	TAPPING SCREW WITH WASHER

	5322 390 20011	VET SILIC.P4 20GR
	3138 128 78420	CRT SOCKET

⊣⊢

1702	4822 265 41419	6P
1705	4822 267 10702	14P MALE (63461B)
1706	4822 255 10379	HPS0720-011100

⊣⊢

2701	4822 126 13196	CER2 **SMD** 25V 100N PM10 R
2702	4822 126 13196	CER2 **SMD** 25V 100N PM10 R
2703	4822 126 13196	CER2 **SMD** 25V 100N PM10 R
2704	4822 126 13196	CER2 **SMD** 25V 100N PM10 R
2707	4822 126 13196	CER2 **SMD** 25V 100N PM10 R
2708	4822 126 13196	CER2 **SMD** 25V 100N PM10 R
2709	4822 126 13196	CER2 **SMD** 25V 100N PM10 R
2711	4822 126 13196	CER2 **SMD** 25V 100N PM10 R
2712	4822 122 33216	270pF 5% 50V
2713	4822 126 13196	CER2 **SMD** 25V 100N PM10 R
2714	4822 124 42171	22µF 25V
2715	4822 122 32504	15pF 2% 63V
2716	4822 126 13196	CER2 **SMD** 25V 100N PM10 R
2718	5322 122 32966	39pF 5% 50V
2719	5322 122 32448	10pF 5% 50V
2720	4822 124 81071	22µF 20% 160V
2721	4822 121 42004	10nF 10% 400V
2722	4822 126 14122	6.8nF 10% 50V
2723	4822 124 80606	1µF 20% 160V
2724	4822 122 33216	270pF 5% 50V
2725	4822 126 13196	CER2 **SMD** 25V 100N PM10 R
2726	4822 126 13196	CER2 **SMD** 25V 100N PM10 R
2728	5322 122 32966	39pF 5% 50V
2729	5322 122 32448	10pF 5% 50V
2730	4822 121 42004	10nF 10% 400V
2731	4822 126 14122	6.8nF 10% 50V
2732	4822 124 80606	1µF 20% 160V
2733	4822 122 33177	10nF 20% 50V
2734	4822 122 33216	270pF 5% 50V
2735	4822 126 13196	CER2 **SMD** 25V 100N PM10 R
2736	4822 126 13196	CER2 **SMD** 25V 100N PM10 R
2737	4822 053 10681	680R00 5% 1W
2739	5322 122 32966	39pF 5% 50V
2740	5322 122 32448	10pF 5% 50V
2741	4822 124 42171	22µF 25V
2742	4822 121 42004	10nF 10% 400V
2743	4822 126 14122	6.8nF 10% 50V
2744	4822 124 80606	1µF 20% 160V
2745	4822 124 41751	47µF 20% 50V
2746	4822 124 40433	47µF 20% 25V
2747	4822 121 43693	10nF 100V
2748	4822 124 80131	100µF 20% 25V
2749	4822 126 13196	CER2 **SMD** 25V 100N PM10 R
2751	4822 124 80131	100µF 20% 25V
2752	5322 122 32654	22nF 10% 63V
2753	5322 122 32654	22nF 10% 63V
2754	4822 126 10326	180pF 5% 63V
2755	4822 124 80131	100µF 20% 25V
2756	4822 124 40433	47µF 20% 25V
2757	5322 124 40641	10µF 20% 100V
2760	5322 122 32658	22pF 5% 50V
2761	5322 122 32658	22pF 5% 50V
2762	5322 122 32658	22pF 5% 50V
2763	5322 122 32658	22pF 5% 50V
2764	4822 122 33177	10nF 20% 50V
2765	4822 126 10326	180pF 5% 63V
2766	5322 122 32448	10pF 5% 50V
2767	4822 122 33646	470pF 10% 500V
2768	4822 126 13196	CER2 **SMD** 25V 100N PM10 R
2769	4822 126 13196	CER2 **SMD** 25V 100N PM10 R
2770	4822 126 13196	CER2 **SMD** 25V 100N PM10 R
2771	4822 121 43693	10nF 100V
2772	4822 122 33968	1nF 5% 500V
2773	4822 126 12267	470pF 10%R(HR) 2KV
2774	4822 126 14102	1OnF 20% 2KV
2776	4822 126 13196	CER2 **SMD** 25V 100N PM10 R
2777	4822 252 60127	DSP-201M-C04F
2778	4822 122 33177	10nF 20% 50V
2779	4822 252 60127	DSP-201M-C04F
2780	4822 252 60127	DSP-201M-C04F
2781	4822 122 33177	10nF 20% 50V
2782	4822 124 40201	1000µF 20% 16V
2783	4822 124 40201	1000µF 20% 16V
2784	4822 126 13196	CER2 **SMD** 25V 100N PM10 R
2785	4822 126 13196	CER2 **SMD** 25V 100N PM10 R
2786	4822 126 13196	CER2 **SMD** 25V 100N PM10 R
2787	4822 126 13196	CER2 **SMD** 25V 100N PM10 R
2788	4822 126 13196	CER2 **SMD** 25V 100N PM10 R
2789	4822 126 13196	CER2 **SMD** 25V 100N PM10 R
2791	5322 124 40641	10µF 20% 100V
2792	5322 124 40641	10µF 20% 100V
2793	5322 124 40641	10µF 20% 100V

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3701	4822 051 20759	75Ω 5% 0.1W
3702	4822 051 20759	75Ω 5% 0.1W
3703	4822 051 20759	75Ω 5% 0.1W
3712	4822 051 20471	470Ω 5% 0.1W
3713	4822 051 20471	470Ω 5% 0.1W
3714	4822 051 20471	470Ω 5% 0.1W
3715	4822 117 11503	220Ω 1% 0.1W
3716	4822 117 11503	220Ω 1% 0.1W
3717	4822 117 11503	220Ω 1% 0.1W
3718	4822 117 11503	220Ω 1% 0.1W
3719	4822 051 20331	330Ω 5% 0.1W
3721	4822 051 20479	47Ω 5% 0.1W
3722	4822 051 20479	47Ω 5% 0.1W
3723	4822 051 20479	47Ω 5% 0.1W
3724	4822 117 11503	220Ω 1% 0.1W
3725	4822 051 20101	100Ω 5% 0.1W
3726	4822 051 20101	100Ω 5% 0.1W
3727	4822 051 20332	3k3 5% 0.1W
3728	4822 050 21009	10Ω 1% 0.6W
3729	4822 051 20332	3k3 5% 0.1W
3731	4822 050 21009	10Ω 1% 0.6W
3732	4822 051 20332	3k3 5% 0.1W
3733	4822 051 20109	10Ω 5% 0.1W
3734	4822 051 20113	11k 5% 0.1W
3735	4822 050 22201	220Ω 1% 0.6W
3736	4822 051 20479	47Ω 5% 0.1W
3739	4822 051 20121	120Ω 5% 0.1W
3740	4822 051 20229	22Ω 5% 0.1W
3741	4822 051 20301	300Ω 5% 0.1W
3743	4822 051 20392	3k9 5% 0.1W
3744	4822 051 20274	270k 5% 0.1W
3745	4822 051 20008	0Ω JUMP. (**SMD**)
3746	4822 051 20479	47Ω 5% 0.1W
3747	4822 051 20105	1M 5% 0.1W
3748	4822 050 21005	1M 1% 0.6W
3749	4822 051 20124	120k 5% 0.1W
3750	4822 050 22203	22k 1% 0.6W
3751	4822 117 10834	47k 1% 0.1W
3752	4822 116 52195	47Ω 5% 0.5W
3753	4822 117 10833	10k 1% 0.1W
3754	4822 051 20479	47Ω 5% 0.1W
3757	4822 051 20121	120Ω 5% 0.1W
3758	4822 051 20301	300Ω 5% 0.1W
3760	4822 051 20229	22Ω 5% 0.1W
3761	4822 051 20392	3k9 5% 0.1W
3762	4822 051 20274	270k 5% 0.1W
3763	4822 051 20008	0Ω JUMP. (**SMD**)
3764	4822 051 20479	47Ω 5% 0.1W
3765	4822 051 20105	1M 5% 0.1W
3766	4822 050 21005	1M 1% 0.6W
3767	4822 051 20124	120k 5% 0.1W
3768	4822 050 22203	22k 1% 0.6W
3769	4822 116 52195	47Ω 5% 0.5W
3770	4822 117 10834	47k 1% 0.1W
3771	4822 117 10833	10k 1% 0.1W
3772	4822 051 20479	47Ω 5% 0.1W
3775	4822 051 20121	120Ω 5% 0.1W
3776	4822 051 20301	300Ω 5% 0.1W
3778	4822 051 20392	3k9 5% 0.1W
3779	4822 051 20274	270k 5% 0.1W
3780	4822 051 20105	1M 5% 0.1W
3781	4822 051 20008	0Ω JUMP. (**SMD**)
3784	4822 050 21005	1M 1% 0.6W
3785	4822 051 20124	120k 5% 0.1W
3786	4822 050 22203	22k 1% 0.6W
3787	4822 116 52195	47Ω 5% 0.5W
3788	4822 117 10833	10k 1% 0.1W
3789	4822 117 10834	47k 1% 0.1W
3790	4822 051 20229	22Ω 5% 0.1W
3791	4822 050 13302	3k3 1% 0.4W
3792	4822 117 11139	1k5 1% 0.1W
3793	4822 051 20105	1M 5% 0.1W
3794	4822 051 20561	560Ω 5% 0.1W
3795	4822 051 20182	1k8 5% 0.1W
3796	4822 051 20562	5k6 5% 0.1W
3797	4822 051 20332	3k3 5% 0.1W
3798	4822 051 20102	1k 5% 0.1W
3799	4822 051 20101	100Ω 5% 0.1W
3800	4822 051 20479	47Ω 5% 0.1W
3801	4822 051 20101	100Ω 5% 0.1W
3802	4822 051 20101	100Ω 5% 0.1W
3803	4822 116 82778	4Ω7 5% 1/6W
3804	4822 051 20102	1k 5% 0.1W
3806	4822 051 20102	1k 5% 0.1W
3807	4822 051 20102	1k 5% 0.1W
3808	4822 051 20102	1k 5% 0.1W
3811	4822 050 21502	1k5 1% 0.6W
3812	4822 116 80548	15k 5% 0.5W
3814	4822 117 10353	150Ω 1% 0.1W
3815	4822 051 20101	100Ω 5% 0.1W
3816	4822 051 20271	270Ω 5% 0.1W
3829	4822 051 20101	100Ω 5% 0.1W
3831	4822 051 20101	100Ω 5% 0.1W
3832	4822 051 20101	100Ω 5% 0.1W

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5702	4822 152 20596	IND FXD SP0305 A 4U7 PM10 B
5703	4822 157 53519	IND FXD SP0406 A 100U PM10 B
5704	4822 152 20596	IND FXD SP0305 A 4U7 PM10 B
5705	4822 152 20596	IND FXD SP0305 A 4U7 PM10 B
5706	3138 128 78040	COIL 0.15µH 10%
5707	3138 128 78040	COIL 0.15µH 10%
5708	3138 128 78040	COIL 0.15µH 10%
5709	4822 157 53189	CHOKE COIL 5.0µH PM10
5710	4822 152 20596	IND FXD SP0305 A 4U7 PM10 B
5711	4822 152 20596	IND FXD SP0305 A 4U7 PM10 B
5712	4822 152 20596	IND FXD SP0305 A 4U7 PM10 B
5713	4822 152 20596	IND FXD SP0305 A 4U7 PM10 B

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6701	4822 130 80877	BAV103
6702	4822 130 30842	BAV21
6703	4822 130 80877	BAV103
6704	4822 130 30842	BAV21
6705	4822 130 80877	BAV103
6706	4822 130 30842	BAV21
6708	4822 130 42489	BYD33G
6709	4822 130 31878	1N4003G
6711	4822 130 80446	BAS32L
6712	5322 130 34337	BAV99
6713	5322 130 34337	BAV99
6714	4822 130 80446	BAS32L
6715	5322 130 34337	BAV99
6721	4822 130 80446	BAS32L
6724	4822 130 80446	BAS32L
6731	4822 130 80446	BAS32L
6734	4822 130 80446	BAS32L

7701	4822 209 16099	TDA4885
7702	4822 209 16103	LXC4389P1
7705	4822 130 41594	PH2369
7706	4822 130 41594	PH2369
7707	4822 130 41594	PH2369
7709	4822 130 41053	BC639
7711	4822 130 41053	BC639
7716	4822 130 41053	BC639
7717	4822 130 41053	BC639
7723	4822 130 41053	BC639
7724	4822 130 41053	BC639
7725	5322 130 42136	BC848C

1158 Earphone panel

Various

1158	3138 128 59270	EARPHONE PCB ASSY
1032	4822 267 31526	CON BM PHONE H 01P F 3.5 ST B
1033	4822 267 31526	CON BM PHONE H 01P F 3.5 ST B

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2081	5322 122 32654	22nF 10% 63V
2082	5322 122 32654	22nF 10% 63V
2084	4822 124 22678	100µF 20% 16V
2085	4822 124 23441	10µF 20% 50V
2086	4822 124 22681	47µF 20% 16V
2087	4822 124 22681	47µF 20% 16V

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3081	4822 051 20331	330Ω 5% 0.1W
3082	4822 051 20331	330Ω 5% 0.1W
3083	4822 050 21502	1k5 1% 0.6W
3084	4822 051 20122	1k2 5% 0.1W
3085	4822 051 20122	1k2 5% 0.1W

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6084	4822 130 31253	BZX79-C2V4

1159 Terminal+Panel ASS'Y

Various

1288	3138 128 59280	TERMINAL PCB ASSY
1001	4822 277 21595	SWI SLI B
1009	4822 265 10782	887 BM M 6P M2.50 RED B
1010	4822 265 10458	15P F 0.85
1002	4822 265 11176	75 OHM (ZL-6500)
1004	4822 265 11176	75 OHM (ZL-6500)
1006	4822 265 11176	75 OHM (ZL-6500)
1012	4822 265 11176	75 OHM (ZL-6500)
1014	4822 265 11176	75 OHM (ZL-6500)

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2001	4822 124 80106	47µF 20% 16V
2002	5322 122 32268	470pF 10% 50V
2003	4822 124 80106	47µF 20% 16V
2004	4822 124 80106	47µF 20% 16V
2005	4822 124 80106	47µF 20% 16V
2006	4822 124 80106	47µF 20% 16V
2007	4822 124 80106	47µF 20% 16V
2011	4822 126 11103	10nF 5% 50V
2012	4822 124 80106	47µF 20% 16V
2013	4822 124 11914	1µF 20% 50V
2104	4822 126 13196	CER2 **SMD** 25V 100N PM10 R

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3001	4822 051 20759	75Ω 5% 0.1W
3002	4822 051 20474	470k 5% 0.1W
3003	4822 051 20759	75Ω 5% 0.1W
3004	4822 051 20759	75Ω 5% 0.1W
3005	4822 051 20759	75Ω 5% 0.1W
3006	4822 051 20759	75Ω 5% 0.1W
3007	4822 051 20759	75Ω 5% 0.1W
3008	4822 117 11449	2k2 1% 0.1W
3009	4822 117 11449	2k2 1% 0.1W
3010	4822 117 11449	2k2 1% 0.1W
3011	4822 117 11449	2k2 1% 0.1W
3012	4822 051 20479	47Ω 5% 0.1W
3013	4822 051 20683	68k 5% 0.1W
3014	4822 051 20202	2k 5% 0.1W
3016	4822 051 20479	47Ω 5% 0.1W
3017	4822 051 20479	47Ω 5% 0.1W
3018	4822 051 20479	47Ω 5% 0.1W
3019	4822 051 20479	47Ω 5% 0.1W
3020	4822 051 20479	47Ω 5% 0.1W
3021	4822 051 20101	100Ω 5% 0.1W
3022	4822 051 20101	100Ω 5% 0.1W
3023	4822 051 20101	100Ω 5% 0.1W
3024	4822 051 20101	100Ω 5% 0.1W

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5001	4822 152 20596	IND FXD SP0305 A 4U7 PM10 B

Spare parts list

6001	4822 130 31631	BYV10-20
6002	5322 130 34337	BAV99
6003	5322 130 34337	BAV99
6004	5322 130 34337	BAV99
6005	5322 130 34337	BAV99

7001	4822 209 16095	BA7657F

1162 Encoder panel

Various

1162	3138 128 59310	ENCODER PCB ASSY
1247	4822 273 10344	ROT. ENCODER 20P
1248	4822 276 13249	SWI TACT B
1249	4822 276 13249	SWI TACT B

6291	4822 130 83789	L-59GYC

1163 Power switch panel

Various

1163	3138 128 59320	DC POWER SWITCH PCB ASSY
1199	4822 276 13886	SWITCH 2P PUSH BUTTON

1167 Speaker ass'y

Various

1167	3138 128 63030	SPEAKER ASSY
	3138 104 41490	SPEAKER HORN
	4822 701 14688	RUBBER SUPPORT-SPEAKER
	3138 101 31440	SPEAKER SPRING

5001	4822 240 10265	8 OHM/2.5W

1168 Speaker ass'y

Various

1168	3138 128 63030	SPEAKER ASSY
	3138 104 41490	SPEAKER HORN
	4822 701 14688	RUBBER SUPPORT-SPEAKER
	3138 101 31440	SPEAKER SPRING

5001	4822 240 10265	8 OHM/2.5W

1169 Microphone ass'y

Various

1169	3138 128 63200	MIC PHONE ASSY
	4822 242 30337	WM-55A103
	3138 128 78440	3P CONNECTOR

Quick Reference for 17" and 19" Monitors

Major Difference Between 19A580BQ/74C And 17A580BQ/74C

ITEM \ MODEL 12 NC	19A580BQ/74C	17A580BQ/74C
1	3138 107 94230 (Front Cabinet Assy)	3138 107 94670 (Front Cabinet Assy)
	3138 104 39260(Front Cabinet)	3138 104 40530 (Front Cabinet)
	3138 104 39310(LENS)	3138 104 40590(LENS)
	3138 104 39320(Function Knob)	3138 104 40580(Function Knob)
	x	3138 104 40600(Speaker-Grille)
	3138 104 39350(Speaker-Panel - R)	x
	3138 104 39340(Speaker Panel -L)	x
2	3138 104 39300(Rotary Knob)	3138 104 40720(Rotary Knob)
8	3138 104 39380(Power Knob)	3138 104 40710(Power Knob)
10	3138 107 94440(Cable Cover Assy)	3138 107 94730(Cable Cover Assy)
	3138 104 39330(Cable Cover)	3138 104 40610(Cable Cover)
	3138 106 49960(P.E. BAG)	3138 106 32610(P.E. BAG)
25	3138 107 94240(Pedestal Assy)	3138 107 94680(Bottom Plate Assy)
	3138 104 39280(Bottom)	3138 104 40550(Bottom)
	3138 104 39290(Base - Pedestal)	3138 104 40560(Base - Pedestal)
26	3138 104 39270(Back Cover)	3138 107 94960(Back Cover Assy)
	x	3138 104 40541(Back Cover)
	x	3138 104 41711(USB Cover)
27	3138 104 40950(USB Cover)	x
125	3138 105 35110(D.F.U.)	3138 105 35190(D.F.U.)
450	3138 106 51130(Carton)	3138 106 51790(Carton)
451	3138 106 51100(Cushion-Top-L)	3138 106 51340(Cushion-Top-L)
452	3138 106 51110(Cushion-Top-R)	3138 106 51350(Cushion-Top-R)
453	3138 106 51120(Cushion-Bottom)	3138 106 51360(Cushion-Bottom)
454	3138 106 38440(P.E. BAG for SET)	3138 106 39690(P.E. BAG for SET)
1155	4822 131 11275 M46LLQ 683X01(S)	4822 131 11277 M41KSX 683X24 (T)
1156	3138 128 62000(Main PCB Assy)	3138 128 62450(Main PCB Assy)
1158	3138 128 59270(Earphone PCB Assy)	3138 128 63380(Earphone PCB Assy)
1166	3138 128 77960(Degaussing Coil Assy)	3138 128 77930(Degaussing PCB Assy)
8160	x	3138 128 72740(Rotation Coil)

Difference List Between 3138 128 59270 And 3138 128 63380

ITEM \ 12 NC	3138 128 59270(Earphone PCB Assy)	3138 128 63380(Earphone PCB Assy)
2081	5322 122 32654(22n/50v)	x
2082	5322 122 32654(22n/50v)	x

Difference List Between 3138 128 62000 And 3138 128 62450

MODEL / 12 NC / ITEM	19A580BQ/74C	17A580BQ/74C
	Main PCB Assy (3138 128 62000)	Main PCB Assy (3138 128 62450)
1263	3138 128 63080(Eeprom Assy)	3138 128 63320(Eeprom Assy)
2603	4822 124 22669(1u/50v)	4822 124 23539(10u/50v)
2674	4822 121 70411(220n/250v)	4822 121 10708(180n/250v)
2681	4822 121 70241(120n/250v)	4822 121 70598(82n/400v)
3175	4822 050 24703(47 k)	4822 050 23904(39k)
3214	4822 051 20102(1 k)	4822 117 10833(10k)
3239	4822 052 10478(4R7)	4822 152 20596(4u7)
3245	4822 050 22203(22 k)	4822 050 21003(10k)
3481	4822 050 26203(62 k)	4822 050 25603(56k)
3501	4822 052 11228(2R2)	4822 052 11108(1 R)
3510	4822 052 11228(2R2)	4822 052 11108(1 R)
3556	4822 117 10442(10 R)	4822 117 12834(22 R)
3562	4822 050 21203(12 k)	4822 050 28202(8K2)
3563	4822 117 11383(12 k)	4822 051 20273(27 K)
3564	4822 051 20102(1 k)	4822 051 20562(5K6)
3566	4822 117 11383(12 k)	4822 117 10834(47 K)
3665	4822 117 10833(10 k)	4822 117 11383(12 K)
5101	3138 118 74160 (Line Filter 14 mH Min)	x
5101	x	3138 178 70890 (Line Filter 15 mH Min)
5102	3138 118 74160 (Line Filter 14 mH Min)	x

Difference List

MODEL / 12 NC / ITEM	17A580BQ/74C	17A580BQ/00C
125	3138 105 35190 D . F . U.	3138 105 35180 D . F . U.
126	3138 105 35210 QUICK SET UP GUIDE	3138 105 35200 QUICK SET UP GUIDE
127	x	3138 105 35330 QUICK SET UP GUIDE
128	3138 106 32610 P.E. BAG	3138 106 33440 P.E. BAG
450	3138 106 51790 CARTON	3138 106 51400 CARTON

Difference List

MODEL / 12 NC / ITEM	19A580BQ/74C	19A580BQ/00C
125	3138 105 35110 D . F . U .	3138 105 35260 D . F . U .
126	3138 105 35210 QUICK SET UP GUIDE	3138 105 35200 QUICK SET UP GUIDE
127	x	3138 105 35330 QUICK SET UP GUIDE
450	3138 106 51130 CARTON	3138 106 51800 CARTON
1151	3138 128 75240 MAINS CORD	3138 128 75250 MAINS CORD

CM5800 BRIEF

A. GENERAL

The CM5800 is a Digitally Controlled Autoscan Color Display Monitor with 19" Low Emission CRT which is specially designed for low cost and high performance. This monitor can operate at horizontal scan frequencies from 30 to 95 kHz and vertical scan frequencies from 47 to 160 Hz.

This monitor is equipped with an embedded microcontroller which can preset the required modes. The CM5800 provides many functions, such as digitally adjustable picture, DDC1/2B, power management, low emission, high immunity, etc.

This monitor complies with MPRII low emission standard and also fulfills TCO'91 automatic power saving requirements. To reduce power consumption to less than 15 watts in standby or suspend mode and less than 5 watts in off mode, the monitor also complies with the energy star computer program initiated by the EPA.

B. DESCRIPTION OF CM5800

This description mainly introduces the functions, including power supply / power saving management, horizontal / vertical deflection, video amplifier, microcontroller, etc.

1. POWER SUPPLY / POWER SAVING MANAGEMENT

POWER SUPPLY:

This monitor is designed with an off-line flyback switch mode power supply which can operate with input from 90 VAC to 270 VAC . The power supply uses an IC (L4990) for current mode pwm controller and drives the mosfet switch directly. The control scheme transforms a switching converter from a voltage source into a multi-output voltage. The control concept exhibits many desirable properties such as inherent over-load protection, stable and fast system response.

The maximum power consumption is up to 130 watts. A power limiting circuit is added for safety reasons.

Secondary feedback via an optocoupler is used to obtain a stable output voltage. The secondary feedback supplies all necessary voltages for deflection and video. Voltage stabilizer IC is used to supply the small signals and microcontroller/EPROM.

POWER SAVING MANAGEMENT:

This monitor can reduce power consumption while no sync pulses are detected by microcontroller and automatically recover to normal power when sync signals are detected by microcontroller.

During power saving mode, the second power supply still delivers 5V to *uc* (CPU).
The consumed power is less than 15 watts during standby / suspend modes, and less than 5 watts during off mode.

2. HORIZONTAL / VERTICAL DEFLECTION

HORIZONTAL DEFLECTION:

SYNC PROCESSING PART:

The heart of horizontal/vertical deflection controller is TDA4858 which can offer complete and efficient small signal sync processing for autosync monitors. This device is fully dc controllable and can be used in applications with a microcontroller as well as stand-alone with potentiometer control.

CM5800 BRIEF

This controller provides sync processing, which can accept separate , composite (H+V) and sync-on-video input signals. A very short setting time after mode change for protection of external power components has been taken.
The TDA4858 provides extensive functions like a flexible smps block and a geometry control with facilities ,leading to excellent picture quality. This device also can directly drive the vertical deflection output stage ,the line driver stage , the E/W output stage and the EHT stage. All controls are dc and tracked with the incoming frequencies.

DEFLECTION PART:

The horizontal deflection is built around the buck converter which makes it possible to combine H-deflection and EHT generator and allows size and e/w correction without influencing EHT.
The flyback pulse from the buck converter is used by the line output.
Transformer (LOT) generates the required 26.0kV anode voltage.
The adjustable focus (G3) and screen (G2) voltages are internally derived from the anode voltage. Other secondary windings are used to generate the voltages for G1 and horizontal raster DC shift. For 19 inch monitor also provides dynamic focus on G4 to get a good focus performance.(G4 also adjustable).
To guarantee constant EHT over the whole frequency range , the B+ is made tracked with H-frequency by means of a step down converter.
The horizontal size and east/west correction are obtained by varying the voltage of buck converter of the lower deflection a circuit.

Five-capacitors switch and dc controlled linearity coil are designed for optimal screen linearity.
For safety reasons ,x-ray protection circuit is included ,and the control information sensing by TDA4858 will shut down the h-deflection (and there by EHT generator) if the anode voltage exceeds a certain value.
This circuit is also used for beam current overload protection . Shut down the deflection in case the total beam current exceeds a certain limit to protect both CRT and LOT.

VERTICAL DEFLECTION:

The majority of vertical deflection functions is integrated by two ICs ; TDA4858 and TDA8172.
The TDA4858 takes care of sync polarity correction ,automatic catching and holding of the vertical oscillator ,generation of sawtooth drive current for vertical output and vertical s-correction ,and generation of a correct V-blanking pulse for video blanking during vertical retrace lines.
The TDA8172 which is a dc-coupled vertical deflection booster with differential input signals is suitable for color monitor. The output stage has thermal and soar protection ,and high linear sawtooth signal amplification to obtain the required vertical deflection current.
To obtain a fast vertical retrace for non-VGA mode an external flyback supply is used.

3. VIDEO AMPLIFIER

The heart of the video circuit is TDA4885. This controller can drive the hybrid post-amp. CR6927 by buffer stage. The video DC level and gain at the cathode will be controlled by the software.
The red, green and blue video signals are amplified and inverted by the preamplifier to output stage and AC coupled to the CRT cathodes.
Three cut-off adjustments are provided to set the video black level at cathode for all three guns. Also three individual gain adjustments are provided to adjust the white point at maximum swing. Both cut-off and gain controls are digital type controled by microprocessor.
For limiting the beam current and preventing local doming, the beam current limit will automatically reduce the video swing in case the maximum beam current is exceeded (ABL adjustment: R3647).
Brightness control, which is controlled by TDA4885, reduces power consumption in video amplifier. To suppress the vertical retrace lines during vertical retrace, a vertical blanking pulse is added to grid 1.
A spot-killer circuit is also added to prevent CRT spot burn-in when the set is switched off.

DDC 1/2B:

Via SDA, data about the monitor, including the serial number, production codes, CRT type and applicable timings are stored in the EEPROM (24IC21). To avoid picture interference, the reading and writing processes are executed during vertical blanking which is informed by the vertical sync.

4. MICROCONTROLLER

GENERAL DESCRIPTION:

The Philips P87C380 microprocessor is used to control the monitor. The preset data are stored in EEPROM ST24W08.

HARDWARE DEFINITION:

A. KEYBOARD
There are 3 key pads and one rotary encoder at the front of monitor for the OSD control.
- OSD function key:
Push it to confirm entrance or exit from the OSD window
- Encoder:
To select or adjust the parameters which are chosen from OSD.
- Brightness key:
Push it, the OSD shows the window, then adjust with the encoder.
- Contrast key:
Push it, the OSD shows the window, then adjust with the encoder.

B. OSD WILL DISAPPEAR AND SAVE AUTOMATICALLY AFTER NON-OPERATION
C. SOFTWARE WILL CONTROL THE DPMS ACCORDING TO THE SYNC STATUS.

D. VIDEO PRESET MODES

Preset video resolution and sync. Polarities

Resolution modes	H frequency	V frequency	H	V
720 x 400	31.469K	70.087Hz (VGA)	-	+
640 x 480	31.469K	59.940Hz (VESA/60)	-	-
640 x 480	37.500K	75.000Hz (VESA/75)	-	-
640 x 480	43.269K	85.008Hz (VESA/85)	-	-
800 x 600	37.879K	60.317Hz (VESA/60)	+	+
800 x 600	46.875K	75.000Hz (VESA/75)	+	+
800 x 600	53.674K	85.061Hz (VESA/85)	+	+
1024 x 768	48.363K	60.004Hz (VESA/60)	-	-
1024 x 768	60.023K	75.029Hz (VESA/75)	+	+
1024 x 768	68.677K	84.997Hz (VESA/85)	+	+
1280 x 1024	63.981K	60.020Hz (VESA/60)	+	+
1280 x 1024	80.000K	75.000Hz (VESA/75)	+	+
1280 x 1024	91.146K	85.024Hz (VESA/85)	+	+
1600 x 1200	75.000K	60.000Hz (VESA/60)	+	+
1600 x 1200	93.750K	75.000Hz (VESA/75)	+	+

TELEVISION/MONITOR SAFETY GUIDELINES FOR THE PROFESSIONAL SERVICE TECHNICIAN

Safety Checks

After the original service problem has been corrected, a complete safety check should be made. Be sure to check over the entire set, not just the areas where you have worked. Some previous servicer may have left an unsafe condition, which could be unknowingly passed on to your customer. Be sure to check all of the following:

Fire and Shock Hazard

1. Be sure all components are positioned in such a way as to avoid the possibility of adjacent component shorts. This is especially important on those chassis which are transported to and from the service shop.
2. Never release a repaired unit unless all protective devices such as insulators, barriers, covers, strain reliefs, and other hardware have been installed in accordance with the original design.
3. Soldering and wiring must be inspected to locate possible cold solder joints, solder splashes, sharp solder points, frayed leads, pinched leads, or damaged insulation (including the ac cord). Be certain to remove loose solder balls and all other loose foreign particles.
4. Check across-the-line components and other components for physical evidence of damage or deterioration and replace if necessary. Follow original layout, lead length, and dress.
5. No lead or component should touch a receiving tube or a resistor rated at 1 watt or more. Lead tension around protruding metal surfaces or edges must be avoided.
6. Critical components having special safety characteristics are identified with an s by the Ref. No. in the parts list and enclosed within a broken line* (where several critical components are grouped in one area) along with the safety symbol s on the schematic diagrams and /or exploded views.
7. When servicing any unit, always use a separate isolation transformer for the chassis. Failure to use a separate isolation transformer may expose you to possible shock hazard, and may cause damage to servicing instruments.
8. Many electronic products use a polarized ac line cord (one wide pin on the plug). Defeating this safety feature may create a potential hazard to the servicer and the user. Extension cords which do not incorporate the polarizing feature should never be used.
9. After reassembly of the unit, always perform an ac leakage test or resistance test from the line cord to all exposed metal parts of the cabinet. Also, check all metal control shafts (with knobs removed), antenna terminals, handles, screws, etc. to be sure the unit may be safely operated without danger of electrical shock .

* Broken line — • — • — • — • —

Implosion

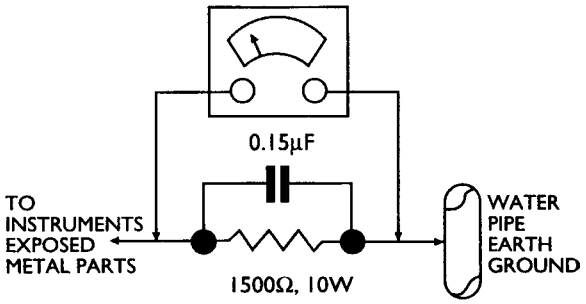
1. All picture tubes used In current model receivers are equipped with an integral implosion system. Care should always be used, and safety glasses worn, whenever handling any picture tube. Avoid scratching or otherwise damaging the picture tube during installation.
2. Use only replacement tubes specified by the manufacturer.

X-radiation

1. Be sure procedures and instructions to all your service personnel cover the subject of X-radiation. Potential sources of X-rays in TV receivers are the picture tube and the high voltage circuits. The basic precaution which must be exercised is to keep the high voltage at the factory recommended level.
2. To avoid possible exposure to X-radiation and electrical shock, only the manufacturer's specified anode connectors must be used.
3. It is essential that the service technician has an accurate HV meter available at all times. The calibration of this meter should be checked periodically against a reference standard.
4. When the HV circuitry is operating properly there is no possibility of an X-radiation problem. High voltage should always be kept at the manufacturer's rated value - no higher - for optimum performance. Every time a color set is serviced, the brightness should be run up and down while monitoring the HV with a meter to be certain that the HV is regulated correctly and does not exceed the specified value. We suggest that you and your technicians review test procedures so that HV and HV regulation are always checked as a standard servicing procedure, and the reason for this prudent routine is clearly understood by everyone. It is important to use an accurate and reliable HV meter. It is recommended that the HV reading be recorded on each customer's invoice, which will demonstrate a proper concern for the customer's safety.
5. When troubleshooting and making test measurements in a receiver with a problem of excessive high voltage, reduce the line voltage by means of a Variac to bring the HV into acceptable limits while troubleshooting. Do not operate the chassis longer than necessary to locate the cause of the excessive HV.
6. New picture tubes are specifically designed to withstand higher operating voltages without creating undesirable X-radiation. It is strongly recommended that any shop test fixture which is to be used with the new higher voltage chassis be equipped with one of the new type tubes designed for this service. Addition of a permanently connected HV meter to the shop test fixture is advisable. The CRT types used in these new sets should never be replaced with any other types, as this may result in excessive X-radiation.
7. It is essential to use the specified picture tube to avoid a possible X-radiation problem.
8. Most TV receivers contain some type of emergency "Hold Down" circuit to prevent HV from rising to excessive levels in the presence of a failure mode. These various circuits should be understood by all technicians servicing them, especially since many hold down circuits are inoperative as long as the receiver performs normally.

Leakage Current Cold Check

1. Unplug the ac line cord and connect a jumper between the two prongs of the plug.
2. Turn on the power switch.
3. Measure the resistance value between the jumpered ac plug and all exposed cabinet parts of the receiver, such as screw heads, antennas, and control shafts. When the exposed metallic part has a return path to the chassis, the reading should be between 1 megohm and 5.2 megohms. When the exposed metal does not have a return path to the chassis, the reading must be infinity. Remove the jumper from the ac line cord.



Leakage Current Hot Check

1. Do not use an isolation transformer for this test. Plug the completely reassembled receiver directly into the ac outlet.
2. Connect a 1.5k, 10W resistor paralleled by a 0.15uF. capacitor between each exposed metallic cabinet part and a good earth ground such as a water pipe, as shown above.
3. Use an ac voltmeter with at least 5000 ohms/ volt sensitivity to measure the potential across the resistor.
4. The potential at any point should not exceed 0.75 volts. A leakage current tester may be used to make this test; leakage current must not exceed 0.5milliamps. If a measurement is outside of the specified limits, there is a possibility of shock hazard. The receiver should be repaired and rechecked before returning it to the customer.
5. Repeat the above procedure with the ac plug reversed. (Note:An ac adapter is necessary when a polarized plug Is used. Do not defeat the polarizing feature of the plug.)

Picture Tube Replacement

The primary source of X-radiation in this television receiver is the picture tube. The picture tube utilized in this chassis is specially constructed to limit X-radiation emissions. For continued X-radiation protection, the replacement tube must be the same type as the original, including suffix letter, or a Philips approved type.

Parts Replacement

Many electrical and mechanical parts in Philips television sets have special safety related characteristics. These characteristics are often not evident from visual inspection nor can the protection afforded by them necessarily be obtained by using replacement components rated for higher voltage, wattage, etc. The use of a substitute part which does not have the same safety characteristics as the Philips recommended replacement part shown in this service manual may create shock, fire, or other hazards.

WARNING: Before removing the CRT anode cap, turn the unit **OFF** and short the HIGH VOLTAGE to the CRT DAG ground.
SERVICE NOTE: The CRT DAG is not at chassis ground.

Service
Service
Service

Advanced DDC Programming Kit

(July 01 1997
Revision 2.0)

97.01

Service Information

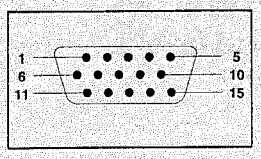
Service information 4822 727 21038 is herewith cancelled.

This [DDC Module (DDC cable)= 4822 320 12004(=4822 724 27550)] and
[DDC V2(DDCV2N.EXE) software(3.5" disk)=4822 711 00024(= 4822 724 27560)]
are used for "BU Monitor - Chungli product range" which incorporates a DDC1/DDC2B function that allows bi-directional communication between the monitor and PC system for optimal video configuration.
[July 01 1997, Revision 2.0] ,which upgrades the software and service information(4822 727 21027 & 4822 727 21038) , is fully compatible with previous one.

Additional information :
Additional information about DDC (Display Data Channel) may be obtained from Video Electronics Standards Association (VESA). Extended Display Identification (EDID) information may be also be obtained from VESA.

Pin assignment

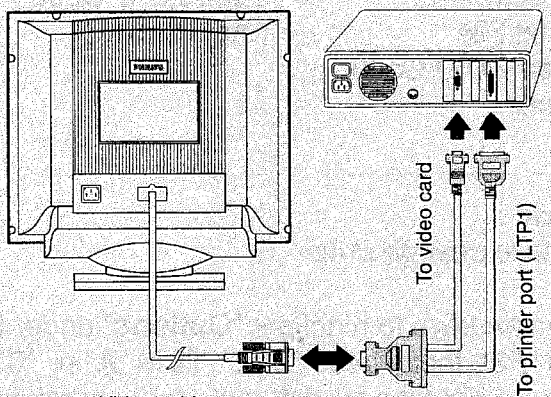
The 15-pin D-sub connector (male) of the signal cable (3 rows) for DDC feature :



Pin No.	Assignment	Pin No.	Assignment
1	Red video input	9	No pin
2	Green video input	10	Logic ground
3	Blue video input	11	Identical output connected to pin 10
4	Identical output connected to pin 10	12	Serial data line (SDA)
5	Ground	13	H.sync
6	Red video ground	14	V. sync (VCLK for DDC)
7	Green video ground		
8	Blue video ground	15	Data clock (SCL)

Connection

(Rear of the monitor)



Video cable

DDC data re-programming

1. General
In case the DDC data memory IC, replaced due to a defect the data contents of this IC have to be re- programmed via a PC.
In case of replacement of the video board it is advised to re-soldered DDC IC from the old board onto the new board, in this case the IC dose not need to be re-programmed.

2. DDCV2N.EXE can be used for :
EDID Structure Version/Revision

Version	: 1	
Revision	: 0	(text file)
and		
Version	: 1	
Revision	: 1	(.hex file)

Published by BU Monitor Printed in The Netherlands ©Copyright reserved Subject to modification Oct. 31 1997 GB 4822 727 21995

PHILIPS

INSTRUCTIONS

DDC Reprogramming Instruction (for PHILIPS Branded models)

System Requirements
DDC Module (DDC cable), P/N = 4822 320 12004
An Intel 386 (or above) PC or compatible
DOS 6.0 or above
DDCV2N.EXE software

Procedure
Connect DDC Cable as shown in cover page.
Insert diskette in Drive a: Select Run "**DDCV2N.EXE**" under DOS or Win.
Press "**Enter**" at the introduction screen

Menu Configuration:

File	R/W	Setup	Quit
Load EDID	Write EDID to EEPROM	Options	
Load txt file (V1.0)	Read From EEPROM	Barcode format	
Save EDID	Edit EDID Code		
Save txt File	Auto Scan		
Convert EDID Code			
Os shell			
Exit			

General :
1. How to change drive

Use arrow keys to highlight "**Options**" under the Setup menu, Press "**Enter**".
Press "**F2**", then Press "**ESC**", fill in "**A**" or "**C**".
[(If your .HEX files for different Model numbers in drive "A", then fill in "A").,
(If your .HEX files for different Model numbers in drive "C", then fill in "C").
Normally, to read DDC data from EEPROM of Monitor is enough.]

Press "**Enter**", then Press "**ESC**"

2. How to select .HEX files for different Model numbers
example:

Use arrow keys to highlight "**Load EDID**" under the File menu, Press "**Enter**"
Bring up BRANDED\ Press "**Enter**"

Bring up
..\
21B772BE\
CM58\ ← select, Press "**Enter**"

Bring up
..\ ← at this highlight area, Press "**Enter**", then go back to last screen
19A74C.HEX ← select for 19A580BQ/74C
19A00C.HEX ← select for 19A580BQ/00C

INSTRUCTIONS

How to write DDC hex files to Monitor

Use arrow keys to highlight "**Options**" under the Setup menu, Press "**Enter**"

Tab down to ID Serial Number, Use down arrow key to place the asterisk (*) beside "store in DEC with LSB first". Press "**control/enter**" to save.
(Ensure the top asterisk (*) is beside in store in HEX with LSB first.)

Use arrow keys to highlight "**Load EDID**" under the file menu, Press "**Enter**".

Use arrow keys to highlight "**BRANDED**", Press "Enter".

Use arrow keys to highlight "**the model list under subdirectly**", Press "**Enter**".

Use arrow keys to highlight "**Write EDID to EEPROM**" under the R/W menu, Press "**Enter**".

Use arrow keys to highlight "**Read from EEPROM**" under the R/W menu, Press "**Enter**".

Use arrow keys to highlight "**Edit EDID Code**" under the R/W menu, Press "**Enter**".

Verify the ID Serial number on the screen matches the serial number of the unit.

Verify EDID Structure Version is "Version :1, Revision :1

Press "**ESC**"

Use arrow keys to highlight "**Quit**", Press "**Enter**".

Menu Configuration:

File	R/W	Setup	Quit
Load EDID	Write EDID to EEPROM	Options	
Load txt file (V1.0)	Read From EEPROM	Barcode format	
Save EDID	Edit EDID Code		
Save txt File	Auto Scan		
Convert EDID Code			
Os shell			
Exit			

Remark: ID product code and ID Serial Number setting are for "PHILIPS" & "STENCIL" DDC TEXT

INSTRUCTIONS

How to change the Year, Week & Serial number of Monitor (for BRANDED models)

Use arrow keys to highlight "**Barcode format**"," under the Setup menu, Press "**Enter**".

Bring up :

```
Barcode example : 9741222266
Barcode format  : YYWWSSSSSS
-------------------------------------------------------
```

Fill in 9741222266, press "Enter
Fill in yywwssssss, press "Enter

continue :

```
Barcode example   : 9741222266
Barcode format    : YYWWSSSSSS
-------------------------------------------------------
Manufacture Year  : 1997
Manufacture Week  : 41
Serial no.        : 222266

-----------------------------------------
-----------------------------------------
EDID [16]    Week : 29
EDID [17]    Year : 07 [Year-1990]
EDID [12..15] S/N. : 0003643a


data correct ? (Y/N) Y
```

Fill in "Y", don't press "Enter"

There is a description at the lower of the screen for Barcode format as below.

Barcode format : Y,W,S,X,- (year,week,s/no,ignore,fixed)

```
Y stands for "year".
W stands for "week"
S stands for "s/no (serial number)".
X stands for "ignore". Allow user to fill in any 'character' or 'numeric'.
- stands for "fixed".  User have to fill in Special 'character' or 'numeric' for "AutoScan" if user
                       fill in '-' at "Barcode format :".
```

Use arrow keys to highlight "**Auto Scan**" under the R/W menu, Press "**Enter**".

Bring up: Auto Scan [◇◇△△□□□□□□] ← year, week, serial number can be changed

□ SerialNumber
◇ YearCode
△ WeekCode
* don't care

Fill in "Barcode data (for instance: 9741222266)" beside Auto Scan, press "**Enter**"
9745000240
9640001000

Press "**ESC**" "**ESC**", return to R/W menu.

How to change the serial number of Monitor (for PCEC models)

Use arrow keys to highlight "**Barcode format**"," under the Setup menu, Press "**Enter**".

Bring up :

```
Barcode example : 5800C12345678
Barcode format  : XXXXXSSSSSSS
------------------------------------------------
```

Fill in 5800C12345678, press "Enter
Fill in xxxxxxxssss, press "Enter

continued :

```
Barcode example   : 5800C12345678
Barcode format    : XXXXXSSSSSSS
------------------------------------------------
Manufacture Year  : 1997
Manufacture Week  : 40
Serial no.        : 12345678
Serial no. ASCII  : 5800C12345678
.....
.....

data correct ? (Y/N) Y
```

(can be changed), press "Enter"
(can be changed), press "Enter"
Fill in 5800C12345678, press "Enter"
Fill in "Y", don't press "Enter"

There is a description at the lower of the screen for Barcode format as below.

Barcode format : Y,W,S,X,- (year,week,s/no,ignore,fixed)

Y stands for "year".
W stands for "week"
S stands for "s/no (serial number)".
X stands for "ignore". Allow user to fill in any 'character' or 'numeric'.
- stands for "fixed". User have to fill in Special 'character' or 'numeric' for "AutoScan" if user fill in '-' at "Barcode format :".

Use arrow keys to highlight "**Auto Scan**" under the R/W menu, Press "**Enter**".

Bring up: Auto Scan ***** □□□□□□□□ ← year, week, serial number can be changed

□ SerialNumber
◇ YearCode
△ WeekCode
* don't care

Fill in "Barcode data (for instance: 5800C12345678)" beside Auto Scan, press "**Enter**"
5800J28256153
58008H75602720

Press "**ESC**" "**ESC**", return to R/W menu.

DDC DATA TEXT FILE

For the original DDC TEXT file:

Use arrow keys to highlight "**Load txt file (V1.0)**" under the File menu, Press "**Enter**"

1. Data text file editing options
   The data text file can be edited by the DOS-editor.

2. Re-programming instructions
   - Turn on PC and monitor
   - Connect the module to the PC and monitor, see connection figure on front page.
   - Insert the floppy disk into drive A: and follow the following routine:
   - Type "DDC" and then press "ENTER". On the screen it will show:"Adaptor check...", then the screen will display "main menu".
   - Use the arrow keys to highlighting items 1, 2, 3, 4, 0 :

Step 1 - Select item "1" ,which appear as a highlight,and press "ENTER" to convert a text data into EDID data.
- Enter the text file name with directory path eg. "a:\CM0200\BND14PHL.TXT" and press "ENTER". The available text file on the floppy will now be converted into a binary file that can be downloaded into the memory IC.
- Press "ENTER" to continue, the program will return to main menu.

Step 2 - Select item "2" ,under the main menu , and press "ENTER" to write a complete EDID data file to EEPROM. Now, the data will be loaded into the memory IC.
- Press "ENTER" to continue, the program will return to main menu.

Step 3 - Select item "3" ,under the main menu,and press "ENTER" to verify that EDID downloading is successful. This function also can be used to view current DDC data in monitor.
- Press "ENTER" and follow the indication on the screen to return main menu.

Step 4 - Select item "4" ,under the main menu,and press "ENTER" to enter DOS prompt and DOS Editor of your system. By DOS Editor, the function allow you to modify or update DDC data eg. manufacturing week, serial number etc according to the rear cover type label of the set.
The production serial number of type label consist of:
TY - origin of production centre
00 - technical service change code
95 - production year
12 - production week
123456 - 6 digits (max) serial number

Once the modification of DDC text file is completed under DOS Editor, Quit to DOS prompt and return to main menu by typing "EXIT" and press "ENTER". After text file is modified according above description, you can repeat the process of step 1 to step 3 to re-program DDC data again.

Step 5 - Select item "0" ,under the main menu,and press "ENTER to quit DDC program and return to DOS prompt.

3. Remark 1 :
   During the re-programming, it is recommended to follow step 1,step 2, and step 3.
   Due to different format requirements by customer, If read DDC data from monitor by step 3 , product ID and serial number will show 3 formats, <decimal>, <hexa-decimal>, and <ASCII>, the correct format can be obtained by running step 1 again (the correct format can be detected and identified automatically by step 1 from original text file).

THE CONTROL SOFTWARE FOR MONITORS THROUGH USB

CustoMax for your monitor

version 3.0

- - - -

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  4.4. Image quality controls
  4.5. Hardware & Software settings
  4.6. User guidance

- - -

1. THE CONTENT OF THE PACKAGE

In the package you should find

The USB module
The USB cable
The CD-ROM with the CustoMax software & USB device driver on it
The Directions for use

- - -

2. INSTALLATION

System requirements

Hardware : a PC which supports the USB function and has a USB outlet.
Software: Windows system which supports USB (Win 95 2.1 or Win 98).

THE CONTROL SOFTWARE FOR MONITORS THROUGH USB

Installation of USB module

1. Turn off the monitor and unplug the power cord.
2. Remove the cover of "USBAY" at the back of the monitor.
3. Insert USB module into the slot.
4. Fix the USB module to the monitor by screwing.
5. Plug-in the power cord and turn on the monitor.

To establish the USB connection

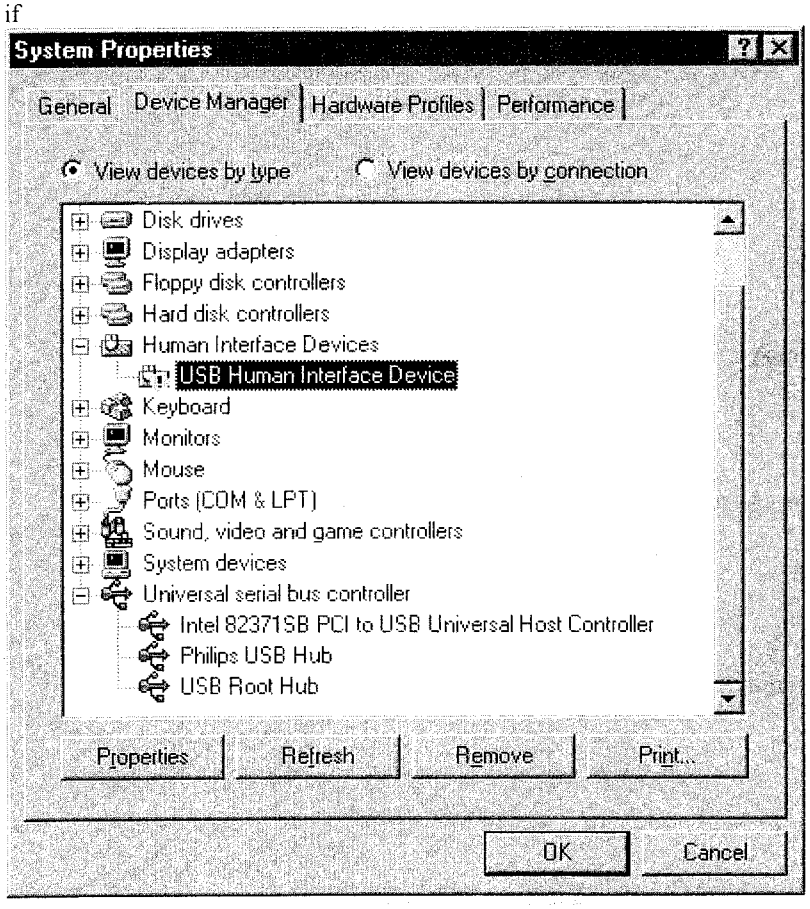
6. Insert CD-Rom
7. The two ends of USB cable attached are different. Plug-in the square end into the "upstream" outlet of the USB module.
8. Plug-in the other end into the USB outlet of the PC.
9. Windows recognises two new pieces of hardware
   - Philips USB hub
   - USB Human Interface Device

   This last item is presented through a wizard.
   Follow the ext" steps on screen (choose the ecommended ptions) until installaion has been finished

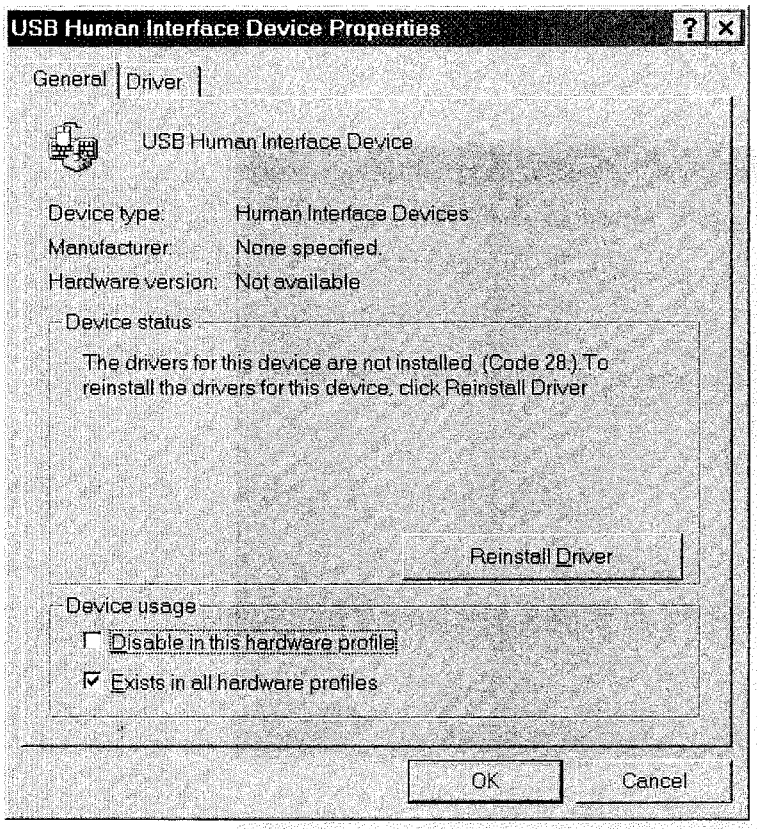
Usages Tips: Check device manager tab in system manager properties.
Human Interface devices
- Philips CustoMax (USB monitor control)

Unversal serial bus controller
- Philips USB Hub

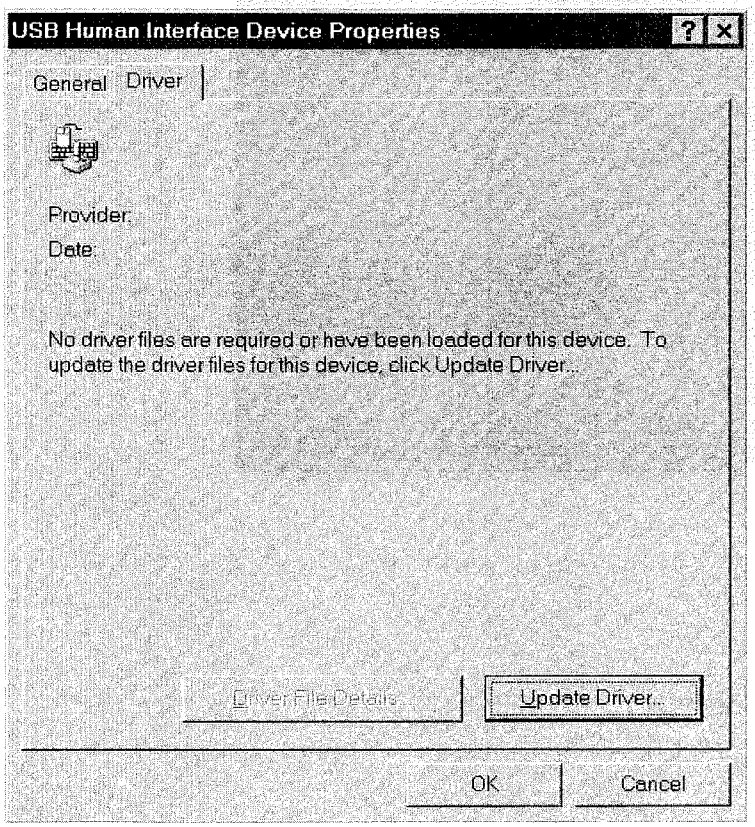
if



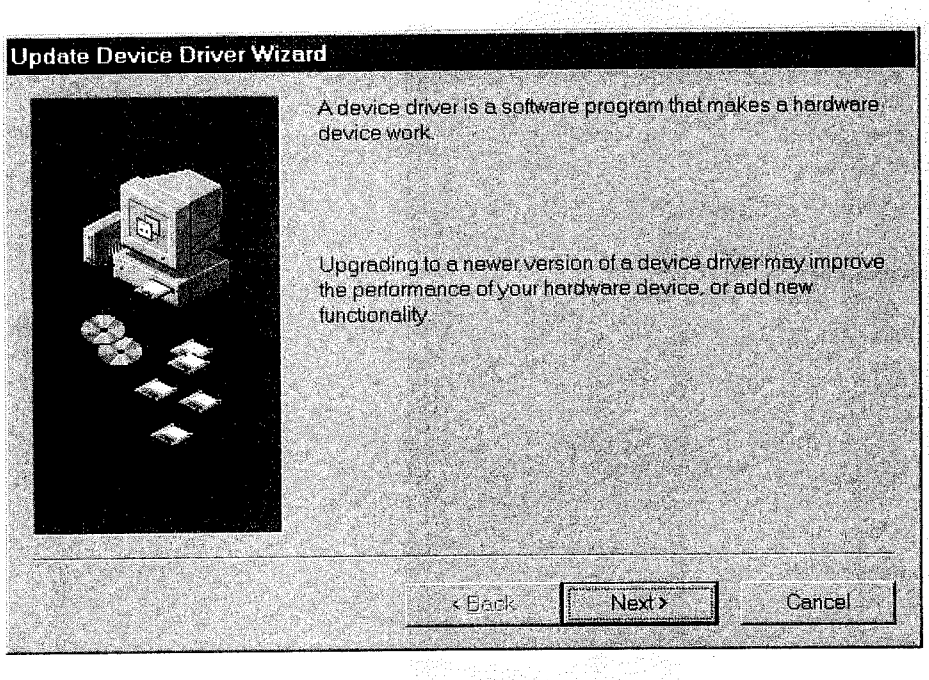
select properties



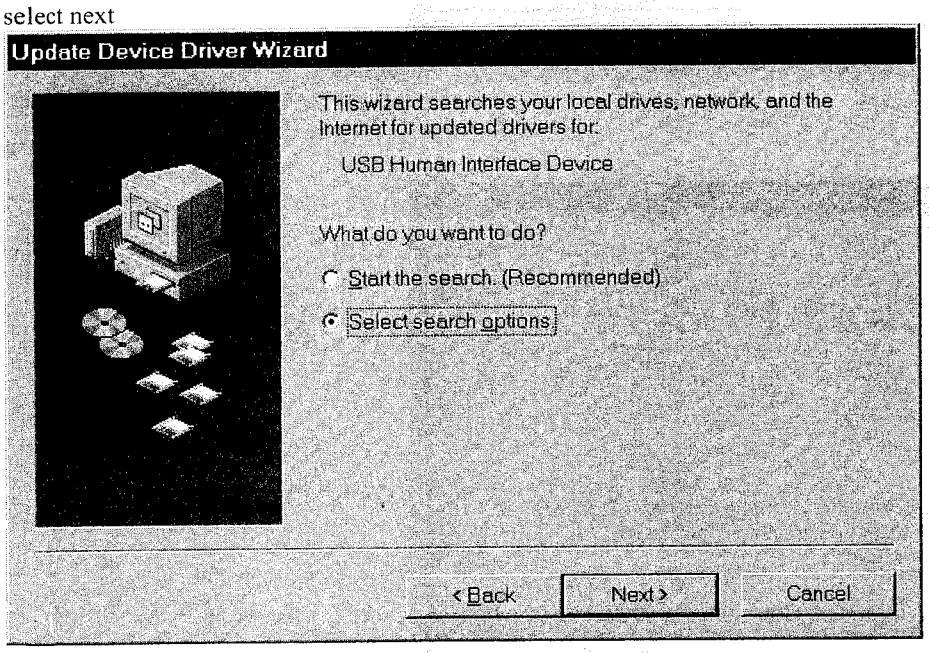
select driver



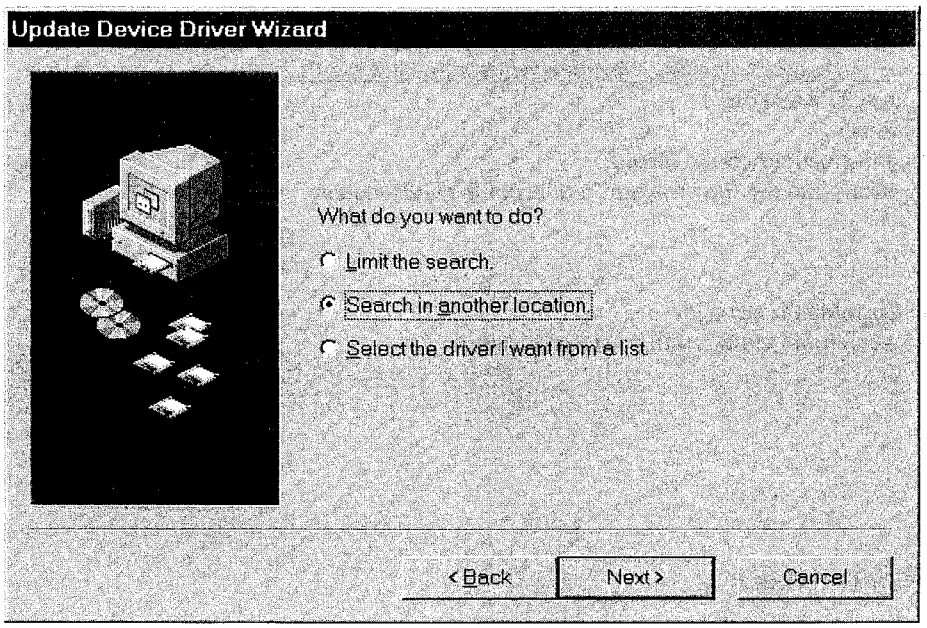
select Update Driver



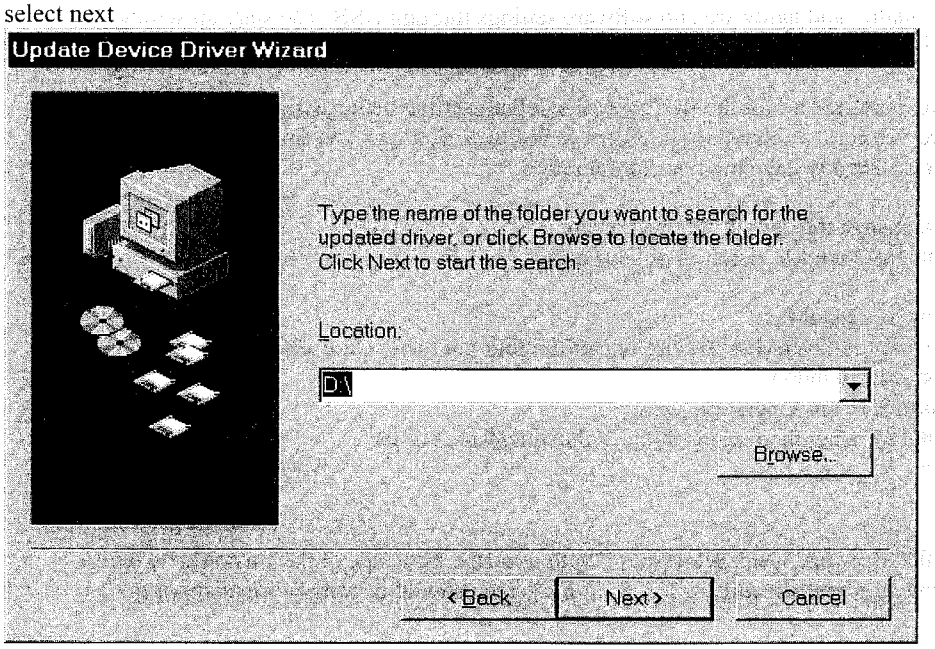
select next



select next



select next



select next

then follow Wizard

Instalation of CustoMax

10. Double click on CD-Rom icon
11. Start the CustoMax installation program: CustoMax 3.exe

CustMax

Start CustoMax using one of these four ways

1. Icon on the right-side of the taskbar
2. Tab in display properties
3. Start menu
4. ctrl-alt-c

There is no need to turn off the PC or monitor when establish USB connection.

THE CONTROL SOFTWARE FOR MONITORS THROUGH USB

Installation of CustoMax

1. Install the USB module and connect the USB cable between your monitor & PC.
2. Put the CD-ROM in the CD-ROM drive.
3. Click on the CD-ROM icon.
4. Follow the installation instructions on the screen.

Plug-in the desired peripherals into the "downstream" outlets of the USB module.

Usage tips

The shortcut to start-up CustoMax is ctrl + alt + c.
If installed on a network server: the settings will be stored locally.

- - -

3. CUSTOMAX 3.0, HOW IT WORKS

CustoMax 3.0 for monitors is a software program for adjusting the audio and video, screen geometry, colour quality, image quality and hardware and software settings through USB. The start-up settings of CustoMax, Window Background and Language can be changed.

Note. When CustoMax is started up for the first time, the default setting being activated will be the 'Hardware & Software Settings'. Within the 'Hardware & Software Settings' you first wil have to select the type of monitor you currently have in your configuration.

DefaultEnables you to change the default selected menu
Usages tip: we recommend sound & vision as default menu.

Main procedures for using CustoMax:

1. To select a specific part of CustoMax, choose one of the four navigation buttons on the left side of the CustoMax window.
2. Select on of the buttons in the 'Operation' area.
3. Perform adjustments by using the buttons in the 'Adjustment' area of the CustoMax window.

Usage tips
To switch off, or on, the 'How to..' Help, select the '?' button, on the right side of the CustoMax window.
To perform adjustments, the contrast and brightness of the screen should be fairly normal and user controllable.

As soon as you finish the program, a DONE is automatically executed to store all settings. Also, before changing the main menu, a DONE is automatically executed. This minimizes the amount of times having to press DONE.

- - -

4. CUSTOMAX, QUICK OVERVIEW

4.1. SOUND & VISION CONTROL

SOUND & VISION CONTROL
To adjust audio and video levels. The options to adjust are: Mute, Volume, Balance, Bass, Treble, Brightness, and Contrast.

MUTE
To switch off/on the sound.

VOLUME
To change the sound level.

BALANCE
To change the sound balance.

BASS
To change the bass level.

TREBLE
With the 'Treble' function you can change the treble level.

BRIGHTNESS
To change the brightness level.

CONTRAST
To change the contrast level.

CONTRAST PATTERN 1
To help you adjust the contrast level.

CONTRAST PATTERN 2
To help you adjust the contrast level.

ADJUSTMENT BUTTONS
To make adjustments to the audio and video levels.

DONE
To save any changes and selections made before closing and returning to the display of the five main navigation and Help buttons.

UNDO
To undo any changes and selections made in this particular part of CustoMax.

Usage Tips
ù The Mute, Volume, Balance, Bass, Treble, Brightness, and Contrast buttons appear after Sound & Vison Control has been selected.
ù With the left mouse button a selected contrast pattern can be toggled to the foreground or background.
ù The Adjustments Buttons only appear after an audio or video button has been selected.
ù The Done and Undo buttons appears after one of the five main navigation buttons on the left side of the CustoMax window has been selected.
ù The Undo function will only be executed after an additional confirmation has been made in the pop-up window.

4.3. COLOUR QUALITY CONTROL

COLOUR QUALITY CONTROL
To adjust the colour temperature.

DEGAUSS
To demagnetise the monitor's screen surface.

FACTORY COLOUR PRESET
To reset the current user-defined colour will back to default. User preset 1 is reset to 9300 K, user preset 2 is reset to 6500 K, and user preset 3 is reset to 5500 K.

FACTORY PRESET 1
To set the colour temperature to 9300 K

FACTORY PRESET 2
To set the colour temperature to 6500 K

FACTORY PRESET 3
To set the colour temperature to 5500 K

USER DEFINABLE PRESETS 1
To change the colour temperature to a user-defined preset.

USER DEFINABLE PRESETS 2
To change the colour temperature to a user-defined preset.

USER DEFINABLE PRESETS 3
To change the colour temperature to a user-defined preset.

RED BACKGROUND COLOUR
To help you adjust the colour balance setting.

GREEN BACKGROUND COLOUR
To help you adjust the colour balance setting.

BLUE BACKGROUND COLOUR
To help you adjust the colour balance setting.

COMBINED BACKGROUND COLOUR
To help you adjust the colour balance setting.

WHITE BACKGROUND COLOUR
To help you adjust the colour balance setting.

COLOUR TRIANGLE
To increase or decrease the proportion of each of the colours Red, Green or Blue.

DONE
To save any changes and selections made before closing and returning to the display of the five main navigation and Help buttons.

UNDO
To undo any changes and selections made in this particular part of CustoMax.

Usage Tips
ù The Degauss function is available under Screen Geometry Control, Colour Quality Control and Image Quality Control.
ù The number of available presets depends on the type of monitor you have selected in the Hardware & Software Settings part of CustoMax.
ù The specific colour temperatures in the three Factory Presets cannot be changed.
ù Adjustments to the colour temperature settings can only be made after first selecting one of the three user presets.
ù To undo the reset to factory default, and to change back to the last defined user preset: Press Undo. The Factory Colour Preset function will immediately be executed, but can be changed back to the last defined user preset by selecting Undo.
ù Move a Draggable Marker in the Colour Triangle, in the Adjustment area of the CustoMax window, to a new position on its axis. Alternatively, drag the central point of the triangle to a new position, or click directly on the new position in the triangle.

HARDWARE & SOFTWARE SETTINGS

HARDWARE & SOFTWARE SETTINGS
To influence the behaviour of your monitor.

THE CONTROL SOFTWARE FOR MONITORS THROUGH USB

HARDWARE & SOFTWARE SETTINGS
To influence the behaviour of your monitor.

POWER SAVER
To reduce monitor power consumption

START-UP' function
To activate or to select the default Navigation setting at start-up. The options are: 'Sound & Vision', 'Geometry', 'Colour Quality', 'Image Quality', or 'Hard- & Software'.

CUSTOMAX WINDOW BACKGROUND
To select a different CustoMax window background. The options are 'Water', 'Fire', 'Air', 'Earth', 'Glas', 'Leave', 'Flowers', 'Monitor housing', 'PCB', 'Droodle' 'Solid Background 1', 'Solid Background 2'.

LANGUAGE
To change to another language. The options are: 'UK English', 'US English', 'Deutsch', 'Fran is', 'Italiano' and 'Espall]Jl'.

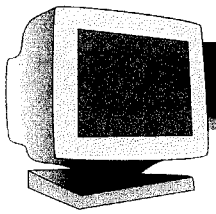
MONITOR TYPE
To select the present type of monitor. The options are: '107', '109', and '201B'.

HARDWARE & SOFTWARE SETTINGS DISPLAY
Provides information on the current 'Hardware & Software Settings'

DONE
To save any changes and selections made before closing and returning to the display of the five main navigation and Help buttons.

UNDO
To undo any changes and selections made in this particular part of CustoMax.

Usage Tips
ù The Power Saver function will be executed after a predetermined period of time, during which the monitor has not been used.
ù The new Navigation default at Start-up will be executed after you have restarted CustoMax.
ù The CustoMax Window Background will be changed immediately after a Selection has been made.
ù The Language will be changed immediately after a Selection has been made.
ù Options relating to the type of monitor selected will be changed immediately after a Selection has been made.
ù The displayed information cannot be manipulated in the area of display.



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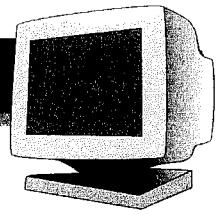
Introduction and Safety



Introduction

The Philips Brilliance 109 color monitor displays sharp and brilliant images of text and graphics with a maximum resolution of 1600x1200 pixels. It is optimal for Windows, CAD / CAM / CAE, desktop publishing, spread sheets, multi-media, and any other application that demands a large screen size and high resolutions.

The monitor automatically scans horizontal frequencies from 30KHz to 95KHz, and vertical frequencies from 50Hz to 160Hz. With microprocessor-based digital-controlled circuitry and On-Screen Display (OSD) controls, the monitor can automatically adjust itself to the video card's scanning frequency and displays an image with the precise parameters you desire.

Features

- An anti-glare, anti-static, and anti-reflection high-contrast screen coating eliminates any bad effects caused by room light reflecting on and dust attracted to the screen's surface.
- With the Color Adjustment feature, you can easily choose different preset color temperatures or set your own customized color parameters.
- The Image Tilt Adjustment feature corrects a rotated image. This correction minimizes the distortions caused by elements such as the Earth's magnetic field.
- The full-size feature expands the image on the monitor to fill the screen when used in factory preset modes.
- USB Bay at back of monitor is prepared for the Universal Serial Bus hub. You can easily and flexibly connect USB-designed devices – such as a mouse or keyboard – to the monitor for true Plug-and-Play function. USB hub shipped separately.
- Green Design – including automatic power saving function (NUTEK) and low-emission compliance (TCO '95) – shows your commitment to the environment.
- DDC1/DDC2B allows communication between the monitor and the PC for optimal video configuration.
- The Power Factor Correction feature improves the power factor and results in higher power-consumption efficiency.
- Moire Cancellation eliminates diffraction, a fringe pattern in the picture.

Note: Your monitor operates according to the VESA DDC level 1/2B. Only computers that support the same guidelines and operate at the same or a higher level can make use of this feature. If your computer does not support the relevant guidelines, you can still use your monitor and computer. However, you may need to manually specify the appropriate resolution in the computer.

As an Energy Star Partner, Philips has determined that this product meets the Energy Star guidelines for energy efficiency.

Contact us at our web site: http://www.monitors.be.philips.com

Safety precautions and maintenance

- Unplug the monitor, if you are not going to use it for an extended period of time.
- Unplug the monitor, if you need to clean it with a slightly damp cloth. Wiping the screen with a dry cloth is okay when the power is off. However, never use alcohol or ammonia-based liquids.
- Consult a service technician if the monitor does not operate normally when following the instructions in this manual.
- The back cover should be removed only by qualified service personnel.
- Keep the monitor out of direct sunlight and away from stoves or any other heat source.
- The top of the monitor is not a shelf. Remove any object that could fall into the vents or prevent proper cooling of the monitor's electronics.
- Keep the monitor dry. To avoid electric shock, do not expose it to rain or excessive moisture.
- Keep the monitor away from magnetic objects, such as speakers, electric motors, transformers, etc.
- When positioning the monitor, make sure the power plug and outlet are easily accessible.

End-of-life disposal

Your new monitor contains materials that can be recycled and reused. Specialized companies can recycle your product to increase the amount of reusable materials and to minimize the amount to be disposed of.

Please find out about the local regulations on how to dispose of your old monitor.

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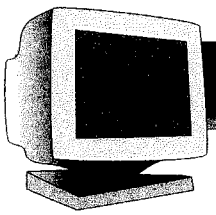
Apple, Macintosh, Quadra, Performa, and Centris are registered trademarks of Apple Computer, Inc.

Description of Controls



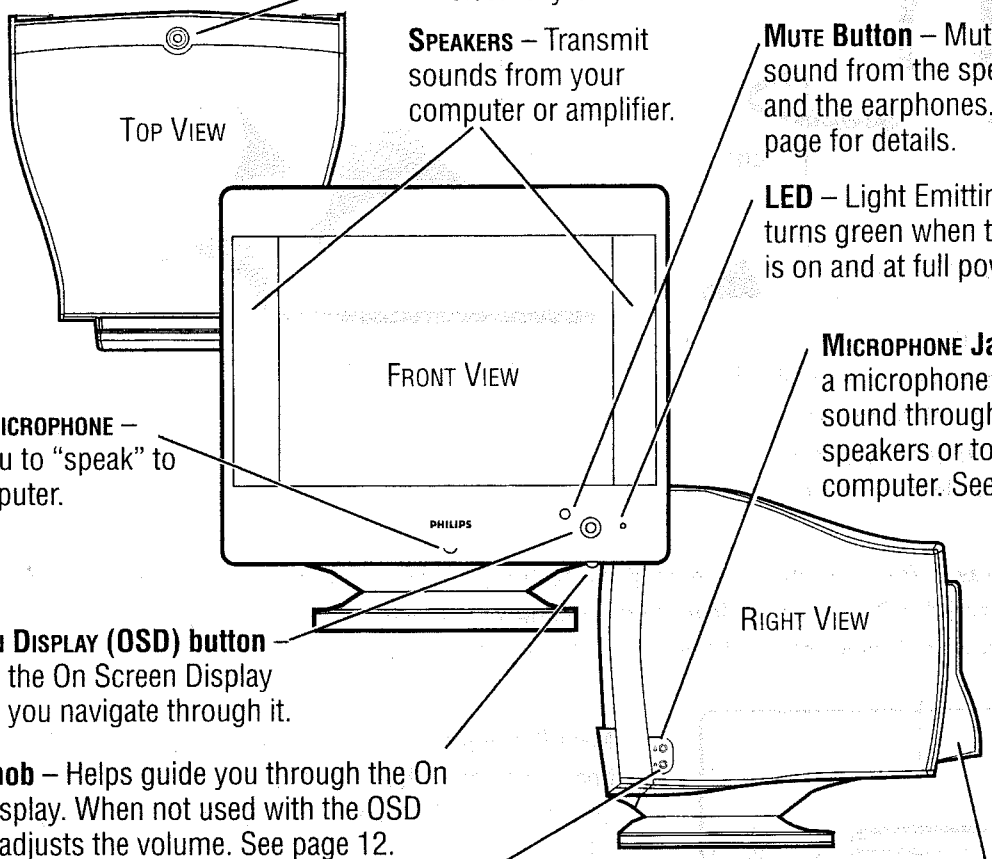
Power Button – Turns the electricity On and Off.

Speakers – Transmit sounds from your computer or amplifier.

Mute Button – Mutes the sound from the speakers and the earphones. See next page for details.

LED – Light Emitting Diode turns green when the monitor is on and at full power.

Microphone Jack – Plug in a microphone to transmit sound through the front speakers or to the computer. See page 18.



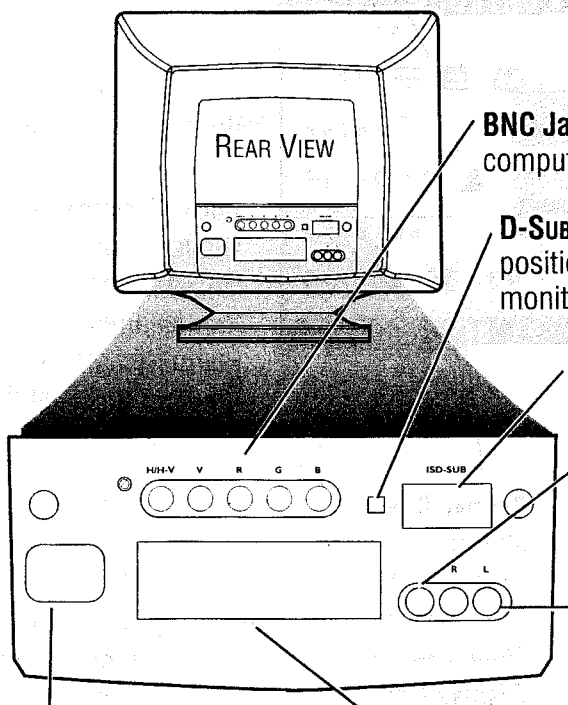
Built-in Microphone – Allows you to "speak" to your computer.

On Screen Display (OSD) button – Brings up the On Screen Display and helps you navigate through it.

Rotary Knob – Helps guide you through the On Screen Display. When not used with the OSD button, it adjusts the volume. See page 12.

Earphones Jack – Plug in earphones here. This mutes the sound from the front speakers.

Cable Cover – Snaps onto the back of the monitor to conceal cable connections. (Cable connections shown in the manual are without the cover on.)



BNC Jacks – Another way of hooking video from the computer to the monitor. See page 17 for details.

D-Sub / BNC Switch – This switch should be in the D-Sub position when using the monitor cable included with the monitor. See page 17 and the foldout for details.

Monitor Cable Plug – Connect one end of the monitor cable here. See foldout for details.

Microphone Jack – Connect the supplied microphone cable to transmit sound from the monitor to a computer or amplifier.

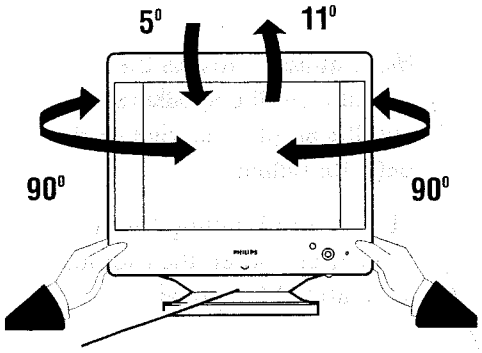
Right & Left Audio-in Jacks – Connect the supplied audio cable to send sound from a computer or amplifier to the monitor's speakers.

Power Plug – Plug the power cord in here. See foldout for details.

USB Bay – Slot for plugging in USB Hub. Optional hardware that allows true Plug-and-Play. See page 17 for details.

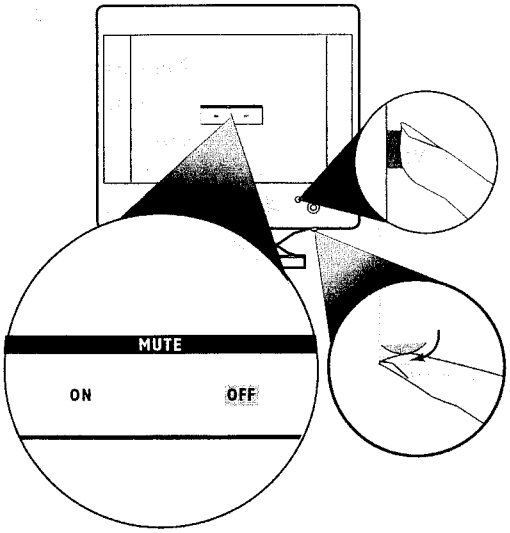
Description of Controls

PEDESTAL



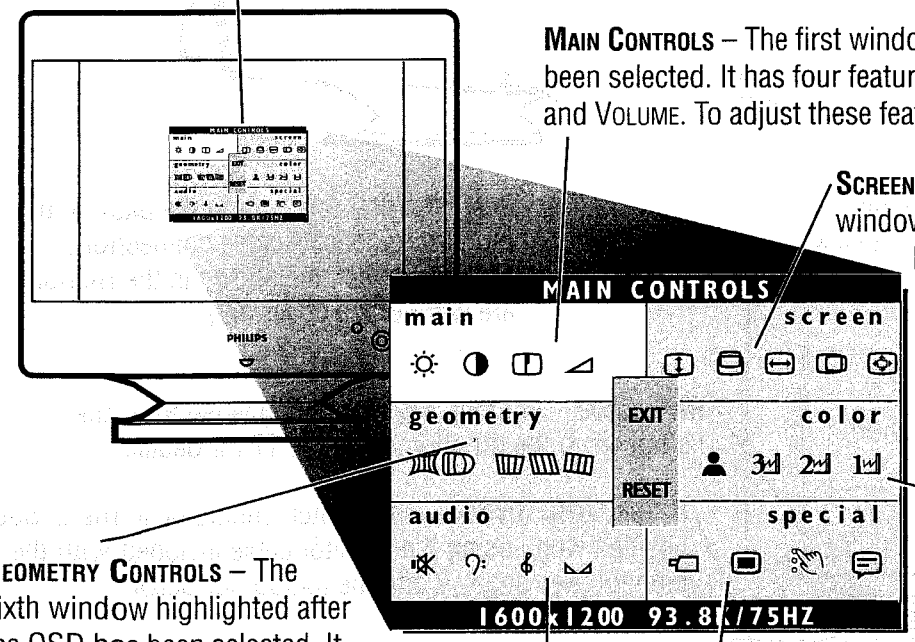
Pedestal – With the built-in pedestal, you can tilt and swivel the monitor to the most comfortable viewing angle. To best use your monitor, always place it at eye level.

FRONT-PANEL MUTE BUTTON



Using the front-panel mute button – To turn the mute On and Off, first press the Mute button. Next, turn the Rotary knob to highlight either On or Off. Then, press the Mute button again. *For another way to mute the sound, see page 14.*

On Screen Display – Your monitor is preset at the factory. However, you can adjust it using the On Screen Display button and the Rotary knob described on page 2. The way to do so is through the On Screen Display (OSD). Below is a brief description of the six On Screen Display windows.



Main Controls – The first window highlighted after the OSD has been selected. It has four features: Brightness, Contrast, Degauss, and Volume. To adjust these features, turn to pages 4 - 5.

Screen Size & Position – The second window highlighted after the OSD has been selected. It has five features: Full Size, Horizontal Position, Horizontal Size, Vertical Position, and Vertical Size. To adjust these features, turn to pages 6 - 8.

Color Temperature – The third window highlighted after the OSD has been selected. It has four features: Cad/Cam, DTP, Photo Retouch, and User Presets. To adjust these features, turn to pages 8 - 9.

Geometry Controls – The sixth window highlighted after the OSD has been selected. It has five features: Pincushion, Balanced Pincushion, Trapezoid, Parallelogram, and Rotation. To adjust these features, turn to page 15.

Audio Controls – The fifth window highlighted after the OSD has been selected. It has four features: Mute, Bass, Treble, and Balance. To adjust these features, turn to page 14.

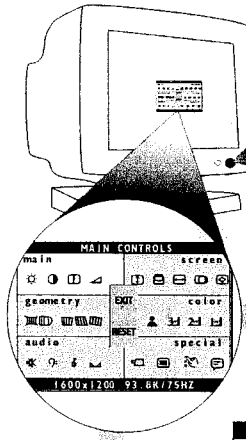
Special Controls – The fourth window highlighted after the OSD has been selected. It has four features: Language, Advanced Controls, OSD Controls, and Video Input. To adjust these features, turn to pages 10 - 13. *Note: Language allows you to change the On Screen Display from English to French, Spanish, German, or Italian. See page 10 for details.*

How to Use the On Screen Display (OSD)

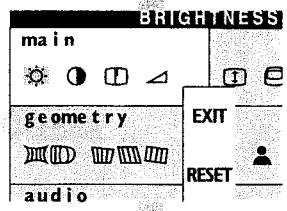
Main Controls window

Brightness

To adjust your screen's brightness, follow the steps below. Brightness is the overall intensity of the light coming from the screen. A 50% brightness level is recommended.



1. Press the On Screen Display button.
2. Press the On Screen Display button to highlight Brightness icon.



3. Press the On Screen Display button to bring up Brightness screen.

4. Turn the Rotary knob (at the lower right-hand corner of the monitor) to adjust the brightness.

5. Press the On Screen Display button to return to Main Controls window.

Smart Help

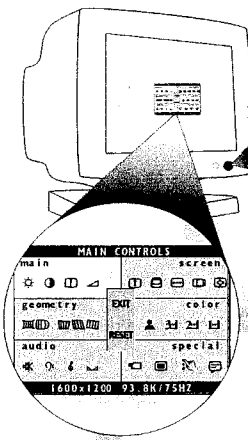
After returning to Main Controls . . .

. . . *to continue to Contrast,* turn the Rotary knob until Contrast icon is highlighted. Next, follow steps 3 - 5 under Contrast.

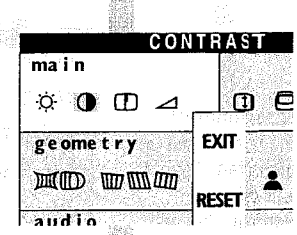
. . . *to exit completely,* press the OSD button and hold for two seconds. (See page 16 for other exit options.)

Contrast

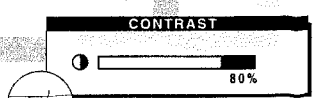
To adjust your screen's contrast, follow the steps below. Contrast is the difference between the light and dark areas on the screen. A 100% contrast level is recommended.



1. Press the On Screen Display button.
2. Press the On Screen Display button. Next, turn the Rotary knob until the Contrast icon is highlighted.



3. Press the On Screen Display button to bring up Contrast screen.



4. Turn the Rotary knob to adjust the contrast.

5. Press the On Screen Display button to return to Main Controls window.

Smart Help

After returning to Main Controls . . .

. . . *to continue to Degauss,* turn the Rotary knob until Degauss icon is highlighted. Next, follow steps 3 - 4 under Degauss (on the next page).

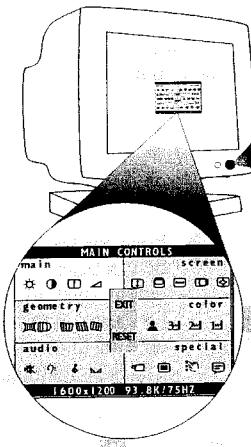
. . . *to exit completely,* press the OSD button and hold for two seconds. (See page 16 for other exit options).

How to Use the On Screen Display (OSD)

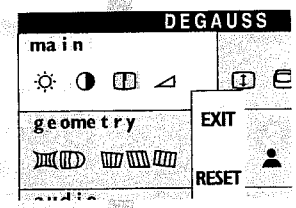
Main Controls window

Degauss

To degauss your screen, follow the steps below. Degaussing removes electromagnetic build up that may distort the color on your screen.



1. Press the On Screen Display button.
2. Press the On Screen Display button. Next, turn the Rotary knob until the Degauss icon is highlighted.



For a moment, the screen will be distorted. Then it will return to normal. You will be back at the Main Controls window.

3. Press the On Screen Display button to degauss your screen.

Smart Help

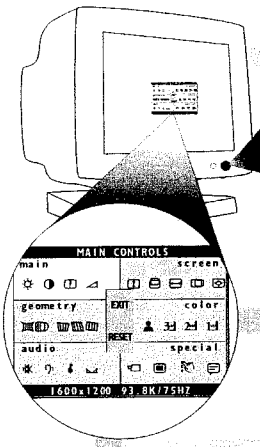
After returning to Main Controls . . .

. . . *to continue to Volume*, turn the Rotary knob until Volume icon is highlighted. Next, follow steps 3 - 5 under Volume.

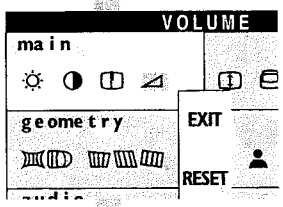
. . . *to exit completely*, press the OSD button and hold for two seconds. (See page 16 for other exit options.)

Volume

To adjust your monitor's volume, follow the steps below. The volume control adjusts the sound from the two front-mounted speakers or the earphones jack.



1. Press the On Screen Display button.
2. Press the On Screen Display button. Next, turn the Rotary knob until the Volume icon is highlighted.



3. Press the On Screen Display button to return to Main Controls window.
3. Press the On Screen Display button to bring up Volume screen.

4. Turn the Rotary knob (at the lower right-hand corner of the monitor) to adjust the volume.

Smart Help

After returning to Main Controls . . .

. . . *to continue to the Screen Size & Position window*, turn the Rotary knob until Exit is highlighted. Next, press the OSD button. Turn to the next page and follow steps 2 - 5 under Full Size.

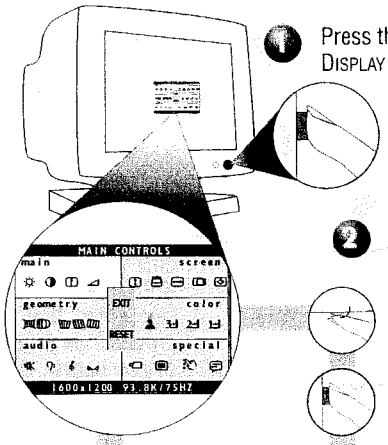
. . . *to exit completely*, press the OSD button and hold for two seconds. (See page 16 for other exit options.)

How to Use the On Screen Display (OSD)

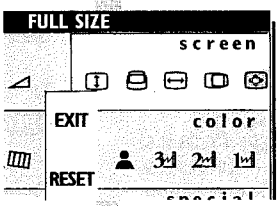
Screen Size & Position window

Full Size

Full Size allows you to adjust the image on your screen to its maximum height and width. If nothing happens when you use this feature, the image is already at full size. You can use Full Size to both enable and disable this feature. *Note: Full Size only works with the monitor's factory presets.*

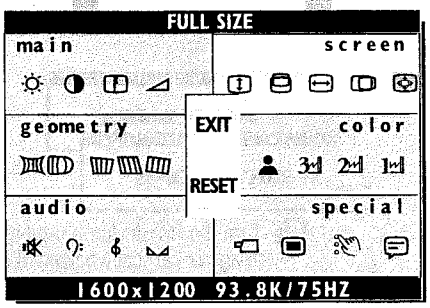


1. Press the On Screen Display button.
2. Turn the Rotary knob until the Screen Size & Position window is highlighted. Next, press the On Screen Display button. The Full Size icon is highlighted.



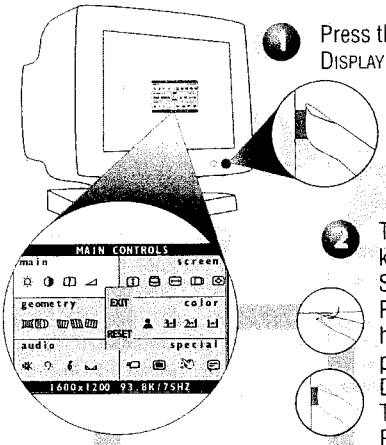
The image will automatically adjust to full size. You can now go on to your next adjustment.

3. Press the On Screen Display button.

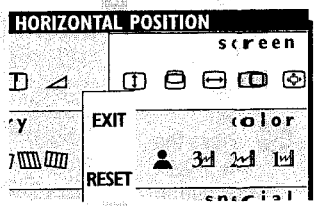


Horizontal Position

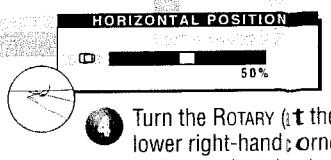
Horizontal Position shifts the image on your screen either to the left or right. Use this feature if your image does not appear centered.



1. Press the On Screen Display button.
2. Turn the Rotary knob until the Screen Size & Position window is highlighted. Next, press the On Screen Display button. Then, turn the Rotary knob until Horizontal Position is highlighted.



3. Press the On Screen Display button to return to Screen Size & Position.
4. Press the On Screen Display button to bring up Horizontal Position screen.



5. Turn the Rotary (at the lower right-hand corner of the monitor) knob until the image is horizontally balanced.

Smart Help

After returning to Screen Size & Position . . .

. . . *to continue to Horizontal Position,* turn the Rotary knob until Horizontal Position is highlighted. Next, follow steps 3 - 5 under Horizontal Position.

. . . *to exit completely,* press the OSD button and hold for two seconds. (See page 16 for other exit options.)

Smart Help

After returning to Screen Size & Position . . .

. . . *to continue to Horizontal Size,* turn the Rotary knob until Horizontal Size is highlighted. Next, follow steps 3 - 5 under Horizontal Size (on the next page).

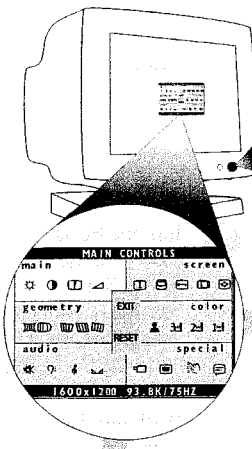
. . . *to exit completely,* press the OSD button and hold for two seconds. (See page 16 for other exit options.)

How to Use the On Screen Display (OSD)

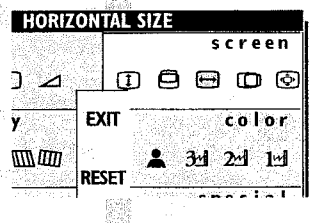
Screen Size & Position window

Horizontal Size

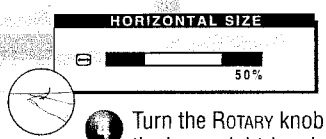
Horizontal Size expands or contracts the image on your screen, pushing it out toward the left and right sides or pulling it in toward the center.



1. Press the On Screen Display button.
2. Turn the Rotary knob until the Screen Size & Position window is highlighted. Next, press the On Screen Display button. Then, turn the Rotary knob until Horizontal Size is highlighted.
3. Press the On Screen Display button.



3. Press the On Screen Display button to return to Screen Size & Position.
4. Press the On Screen Display button to bring up Horizontal Size screen.



4. Turn the Rotary knob (at the lower right-hand corner of the monitor) until the image is the horizontal size you want.

Smart Help

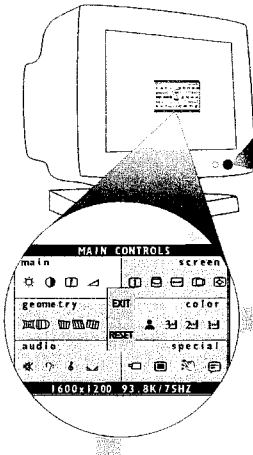
After returning to Screen Size & Position . . .

. . . *to continue to Vertical Position,* turn the Rotary knob until Vertical Position is highlighted. Next, follow steps 3 - 5 under Vertical Position.

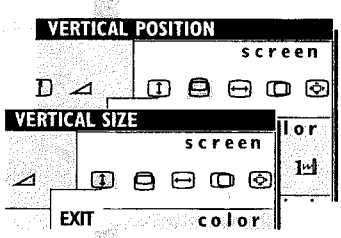
. . . *to exit completely,* press the OSD button and hold for two seconds. (See page 16 for other exit options.)

Vertical Position
Vertical Size

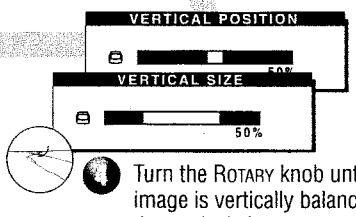
Vertical Position adjusts the image on your screen either up or down. Use this feature if your image does not appear centered Vertical Size expands or contracts the image on your screen, pushing it out toward the top and bottom sides or pulling it in toward the center.



1. Press the On Screen Display button.
2. Turn the Rotary knob until the Screen Size & Position window is highlighted. Next, press the On Screen Display button. Then, turn the Rotary knob until Vertical Position or Vertical Size is highlighted.
3. Press the On Screen Display button.



3. Press the On Screen Display button to return to Screen Size & Position.
4. Press the On Screen Display button to bring up Vertical Position or Vertical Size screen.



4. Turn the Rotary knob until the image is vertically balanced or the vertical size your want.

Smart Help

After returning to Screen Size & Position . . .

. . . *to continue to Geometry window,* turn the Rotary knob until Exit is highlighted. Next, press the OSD button. Then follow steps 2a - 2c under Geometry window on the next page.

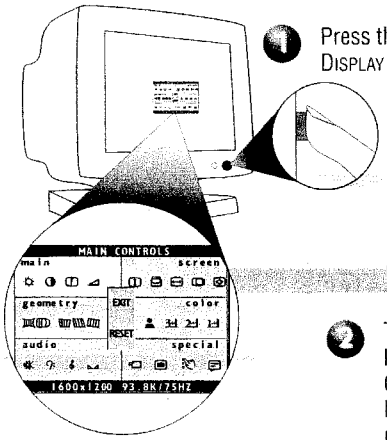
. . . *to exit completely,* press the OSD button and hold for two seconds. (See page 16 for other exit options.)

How to Use the On Screen Display (OSD)

Color Temperature window

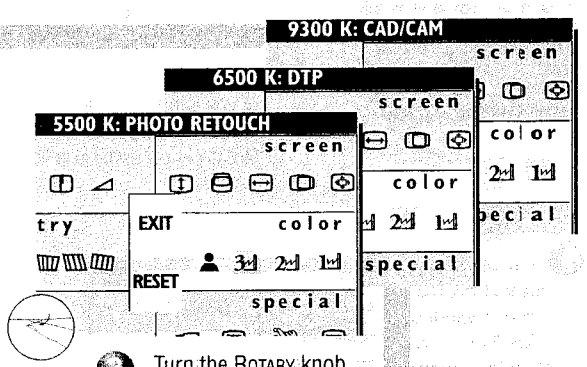
9300 K CAD/CAM / 6500 K DTP / 5500 K Photo Retouch

1 2 3 Your monitor has three preset options you can choose from. One 1 for Computer Aided Design (CAD) work. Two 2 for Desktop Publishing (DTP). And three 3 for Photo Retouch. When you select an option, the computer automatically adjusts itself for that selection.



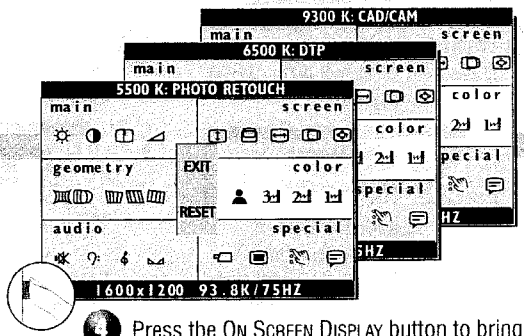
1. Press the On Screen Display button.

2. Turn the Rotary knob until the Color window is highlighted. Then press the On Screen Display button.



3. Turn the Rotary knob until CAD/CAM, DTP, or Photo Retouch is highlighted.

After each preset setting is saved, the on screen display automatically returns to the Color Temperature window. To save the next present setting, simply repeat the steps listed here.



4. Press the On Screen Display button to bring up and save the preset settings for 9300 K CAD/CAM, 6500 K DTP, or 5500 K Photo Retouch.

Smart Help

After returning to Color Temperature . . .

. . . to continue to User Presets, turn the Rotary knob until User Presets is highlighted. Next, follow steps 3 - 9 under User Presets on the next page.

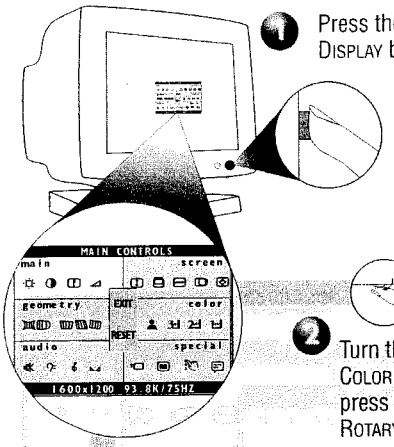
. . . to exit completely, press the OSD button and hold for two seconds. (See page 16 for other exit options.)

How to Use the On Screen Display (OSD)

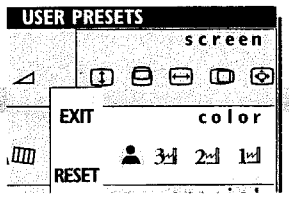
Color Temperature window

User Presets

If you need to adjust any of the three preset options (CAD/CAM, DTP, or Photo Retouch), follow the steps below to modify the colors that appear on your screen. You can make individual adjustments to each of the preset options.

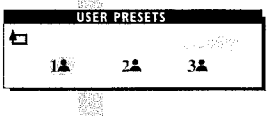


1. Press the On Screen Display button.

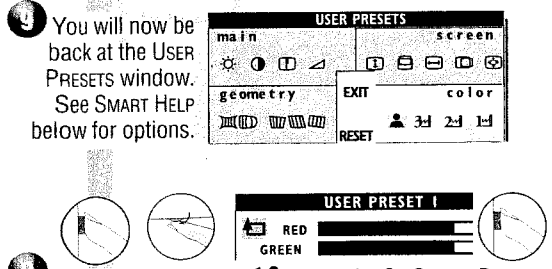


2. Turn the Rotary knob until the Color window is highlighted. Next, press the On Screen Display button. Then, turn the Rotary knob until User Presets icon is highlighted.

3. Press the On Screen Display button to bring up the User Presets window.

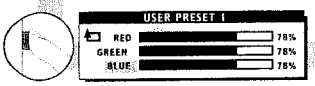


4. If necessary, turn the Rotary knob until 1 of the User Presets is highlighted. Next, press the On Screen Display button.



5. You will now be back at the User Presets window. See Smart Help below for options.

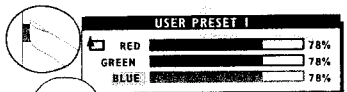
6. To exit User Preset 1 1, press the On Screen Display button. Next, turn the Rotary knob until the Exit box is highlighted. Then, press the On Screen Display button.



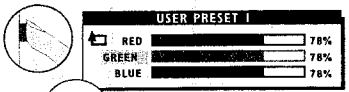
7. When done with green, press the On Screen Display button. Blue will be highlighted.

8. When done with red, press the On Screen Display button. Green will be highlighted.

9. First, press the On Screen Display button. Red will be highlighted.



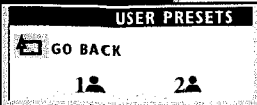
To adjust the blue, press the On Screen Display button again. Then, turn the Rotary knob to increase or decrease the blue.



To adjust the green, press the On Screen Display button again. Then, turn the Rotary knob to increase or decrease the green.

Next, to adjust the red, press the On Screen Display button again. Then, turn the Rotary knob to increase or decrease the red.

Smart Help



To exit User Presets (step 3 above), turn the Rotary knob until the Go Back icon is highlighted Go Back appears by the icon when highlighted. Next, press the On Screen Display button. You will be back at the Color Temperature window.

After returning to Color Temperature . . .

. . . to continue to User Preset 2 or 3, repeat steps 3 through 8, selecting either User Preset 2 or User Preset 3.

. . . to continue to Special Controls window, turn the Rotary knob until Exit is highlighted. Next, press the On Screen Display button. Then, turn the Rotary knob until Special Controls is highlighted. Now, follow steps 2 - 5 under Special Controls on the next page.

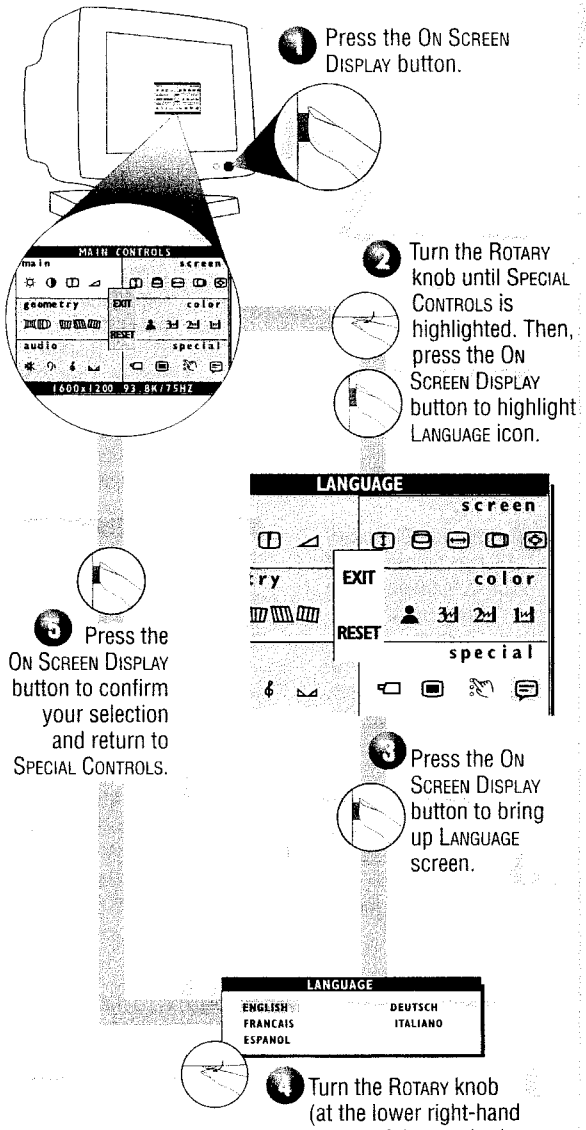
. . .to exit the On Screen Display completely, press the OSD button and hold for two seconds. (See page 16 for other exit options.)

How to Use the On Screen Display (OSD)

Special Controls window

Language

The On Screen Display shows its settings in one of five languages. The default is English, but you can select French, Spanish, German, or Italian.



Smart Help

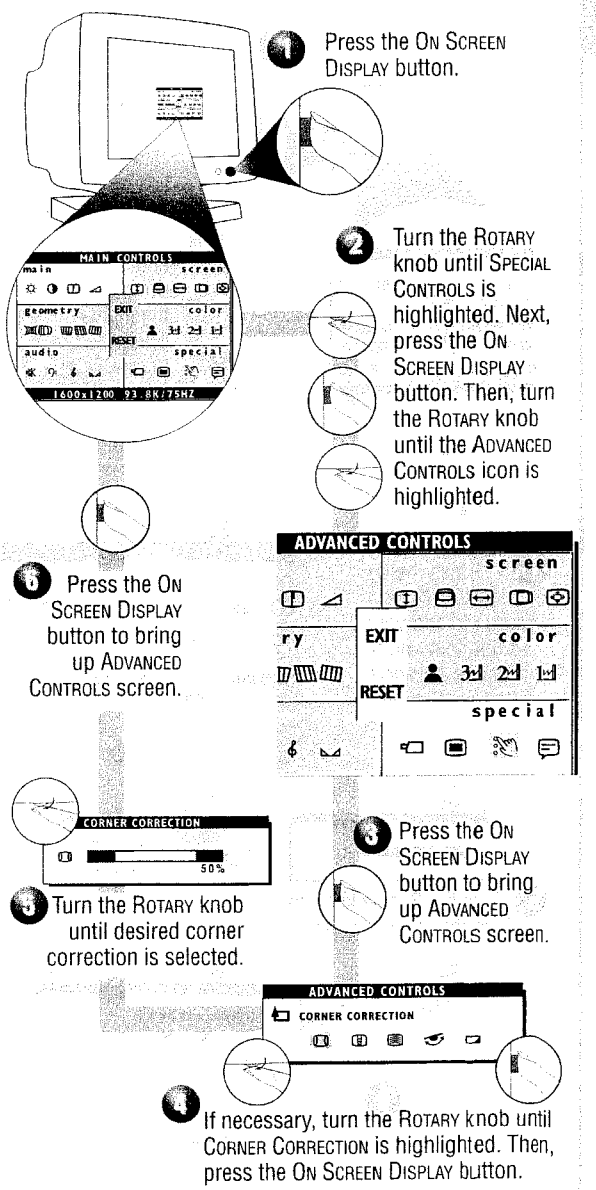
After returning to Special Controls . . .

. . . to continue to Advanced Controls, turn the Rotary knob until Advanced Controls icon is highlighted. Next, follow steps 3 - 6 under Advanced Controls.

. . . to exit completely, press the OSD button and hold for two seconds. (See page 16 for other exit options.)

Advanced Controls
Corner Correction

Advanced Controls is a set of five adjustments. They include Corner Correction, Vertical Linearity, Moire, Rotary Default, and Power Saving. Corner Correction "squares up" the corners of an image on the screen To adjust your Corner Correction, follow the steps below.



Smart Help

After returning to Advanced Controls . . .

. . . to continue to Vertical Linearity, turn the Rotary knob until Vertical Linearity icon is highlighted. Next, follow steps 4 - 6 under Vertical Linearity (on the next page).

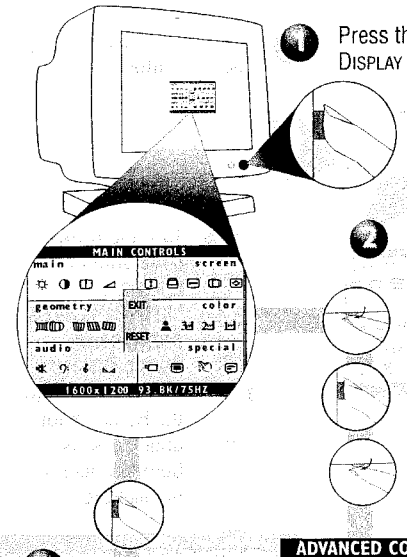
. . . to exit completely, press the OSD button and hold for two seconds. (See page 16 for other exit options.)

How to Use the On Screen Display (OSD)

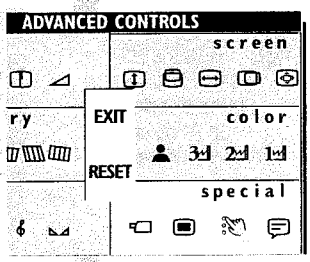
Special Controls window

Advanced Controls
Vertical Linearity

Advanced Controls is a set of five adjustments, including Vertical Linearity. Linearity is the degree with which the actual location of a pixel on the screen corresponds with its intended location. To adjust your Vertical Linearity, follow the steps below.

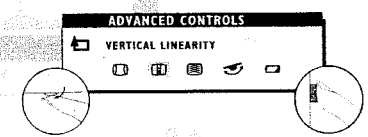


1. Press the On Screen Display button.
2. Turn the Rotary knob until Special Controls is highlighted. Next, press the On Screen Display button. Then, turn the Rotary knob until the Advanced Controls icon is highlighted.



6. Press the On Screen Display button to add your adjustment and to bring up Advanced Controls screen.

3. Press the On Screen Display button to bring up Advanced Controls screen.
5. Turn the Rotary knob to adjust the vertical linearity.



4. Turn the Rotary knob until Vertical Linearity is highlighted. Then, press the On Screen Display button.

Smart Help

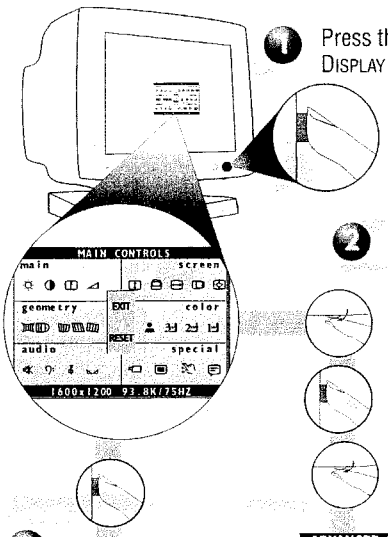
After returning to Advanced Controls . . .

. . . to continue to Moire, turn the Rotary knob until Moire icon is highlighted. Next, follow steps 4 - 7 under Moire.

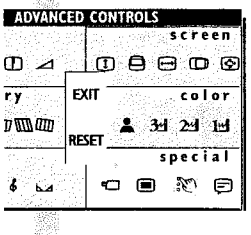
. . . to exit completely, press the OSD button and hold for two seconds. (See page 16 for other exit options.)

Advanced Controls
Moire

Advanced Controls is a set of five adjustments, including Moire. Moire is a fringe pattern arising from the interference between two superimposed line patterns. To adjust your Moire, follow the steps below. *Note: Use only if necessary. By activating Moire, sharpness can be affected.*

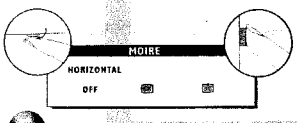


1. Press the On Screen Display button.
2. Turn the Rotary knob until Special Controls is highlighted. Next, press the On Screen Display button. Then, turn the Rotary knob until the Advanced Controls icon is highlighted.



7. Press the On Screen Display button to add your adjustment and to bring up Advanced Controls screen. *See Smart Help to select Vertical Moire or turn Moire Off.*

6. Turn the Rotary knob to adjust the moire.
3. Press the On Screen Display button to bring up Advanced Controls screen.



5. Turn the Rotary knob until Horizontal Moire is highlighted. Then, press the On Screen Display button.
4. Turn the Rotary knob until Moire is highlighted.

Then, press the On Screen Display button.

Smart Help

To select Vertical Moire or to turn Moire off, follow the steps above, selecting Vertical Moire or Moire off in step 5.

After returning to Advanced Controls . . .

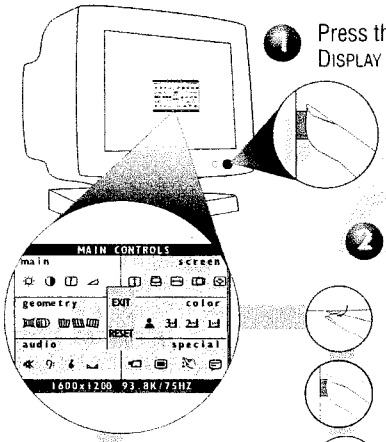
. . . to continue to Rotary Default, turn the Rotary knob until Rotary Default icon is highlighted. Next, follow steps 4 - 6 under Rotary Default. *. . . to exit completely,* press the OSD button and hold for two seconds. (See page 16 for other exit options.)

How to Use the On Screen Display (OSD)

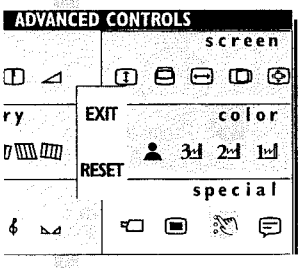
Special Controls window

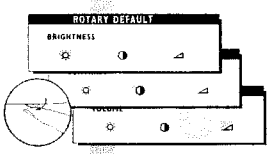
Advanced Controls
Rotary Default

Rotary Default allows you to pick the feature your Rotary knob will default to when not used in adjusting your On Screen Display. The normal default is volume. To select your Rotary Default, follow the steps below.

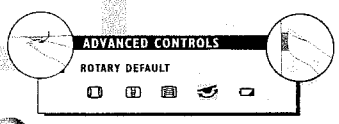


1. Press the On Screen Display button.
2. Turn the Rotary knob until Special Controls is highlighted. Next, press the On Screen Display button. Then, turn the Rotary knob until the Advanced Controls icon is highlighted.
3. Press the On Screen Display button to add your adjustment and return to Advanced Controls.





4. Turn the Rotary knob to select Brightness, Contrast, or Volume.
5. Press the On Screen Display button to bring up Advanced Controls screen.



6. Turn the Rotary knob until Rotary Default is highlighted. Then, press the On Screen Display button.

Smart Help

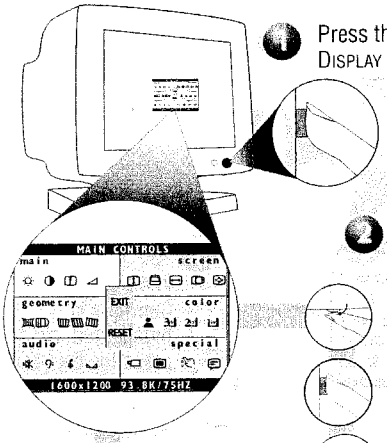
After returning to Advanced Controls . . .

. . . to continue to Power Saving, turn the Rotary knob until Power Saving is highlighted. Next, follow steps 3 - 6 under Power Saving.

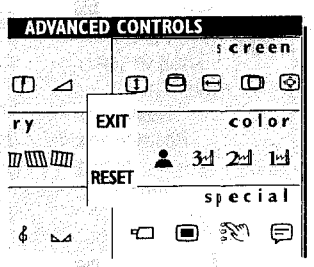
. . . to exit completely, press the OSD button and hold for two seconds. (See page 16 for other exit options.)

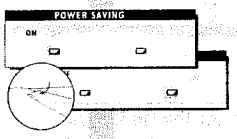
Advanced Controls
Power Saving

Power Saving helps save energy when the monitor is on but not being used. After a preset time, the monitor will go blank if not being used. To select Power Saving, follow the steps below.



1. Press the On Screen Display button.
2. Turn the Rotary knob until Special Controls is highlighted. Next, press the On Screen Display button. Then, turn the Rotary knob until the Advanced Controls icon is highlighted.
3. Press the On Screen Display button to add your adjustment and return to Advanced Controls.





4. Turn the Rotary knob to select Power Saving On or Off.
5. Press the On Screen Display button to bring up Advanced Controls screen.

6. Turn the Rotary knob until Power Saving is highlighted. Then, press the On Screen Display button.

Smart Help

After returning to Advanced Controls . . .

. . . to continue to OSD Controls, turn the Rotary knob until Go Back is highlighted. Next, press the On Screen Display button. Then, turn the Rotary knob to OSD Controls and go to the next page.

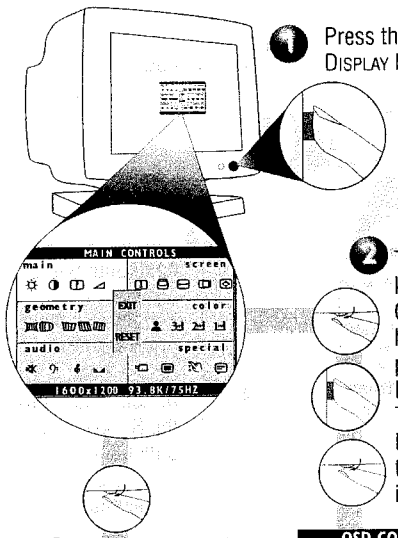
. . . to exit completely, press the OSD button and hold for two seconds. (See page 16 for other exit options.)

How to Use the On Screen Display (OSD)

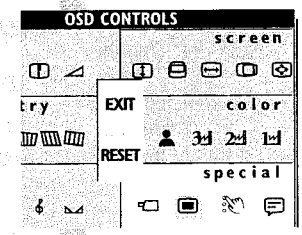
Special Controls window

OSD Controls

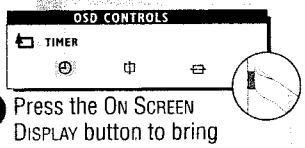
With OSD Controls, you can set the time for the On Screen Display to time out, and change the vertical and horizontal position of the OSD on the monitor screen.



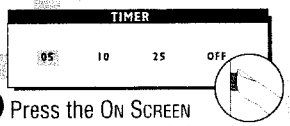
1. Press the On Screen Display button.
2. Turn the Rotary knob until Special Controls is highlighted. Next, press the On Screen Display button. Then, turn the Rotary knob until the OSD Controls icon is highlighted.



3. Press the On Screen Display button to bring up OSD Controls screen.



4. Press the On Screen Display button to bring up Timer screen.



5. Turn the Rotary knob to select 05, 10, 25 seconds, or OFF.
6. Press the On Screen Display button to add your change and return to OSD Controls.
7. Turn the Rotary knob to select either Vertical or Horizontal Position and repeat steps 3 - 6.

Smart Help

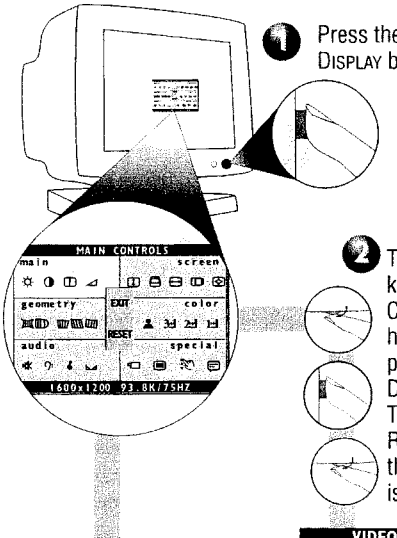
After returning to Special Controls . . .

. . . *to continue to OSD Controls,* turn the Rotary knob until OSD Controls icon is highlighted. The, follow steps 3 - 6 under OSD Controls.

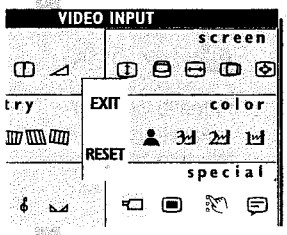
. . . *to exit completely,* press the OSD button and hold for two seconds. (See page 16 for other exit options.)

Video Input

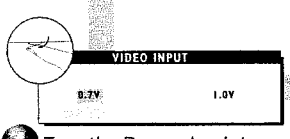
Video Input helps determine what you see on the screen. It is set at 0.7V(olts), but if the video input signal is different than the output signal, you may want to change it to 1.0V.



1. Press the On Screen Display button.
2. Turn the Rotary knob until Special Controls is highlighted. Next, press the On Screen Display button. Then, turn the Rotary knob until the Video Input icon is highlighted.



3. Press the On Screen Display button. The Video Input screen appears.

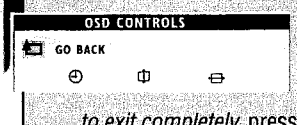


4. Turn the Rotary knob to select either 0.7V or 1.0V.
5. Press the On Screen Display button to save your selection and return to Special Controls.

Smart Help

After returning to OSD Controls . . .

. . . *to continue to Audio Controls,* turn the Rotary knob until Go Back is highlighted. Next, press the On Screen Display button. Then, turn the Rotary knob to Audio Controls window and go to the next page.



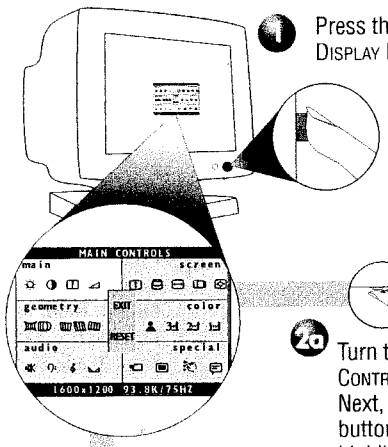
. . . *to exit completely,* press the OSD button and hold for two seconds. (See page 16 for other exit options.)

How to Use the On Screen Display (OSD)

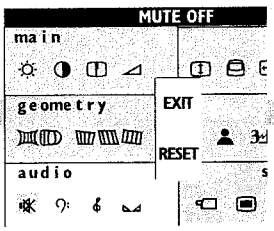
Audio Controls window

Mute, Bass, Treble, Balance

Follow the steps below to modify the sound that comes from your speakers. You can make individual adjustments to each of the preset options (Mute, Bass, Treble, or Balance).



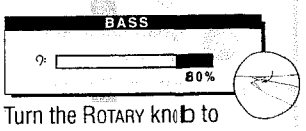
1 Press the On Screen Display button.



2a Turn the Rotary knob until the Audio Controls window is highlighted. Next, press the On Screen Display button. Then, if necessary, turn the Rotary knob until Mute icon is highlighted. If you have sound, MUTE OFF appears at the top of the on screen display.

2b Press the On Screen Display button to mute the sound from your speakers and to return to Audio Controls window. MUTE ON appears at the top of the on screen display.

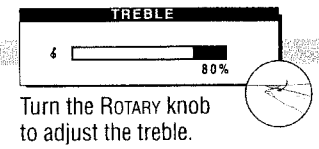
3a To select Bass, turn the Rotary knob until Bass icon is highlighted. Next, press the On Screen Display button.



3b Turn the Rotary knob to adjust the bass.

3c When done, press the On Screen Display button to save the change and return the screen to Audio Controls.

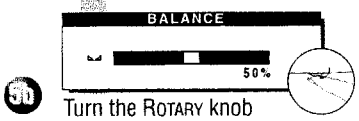
4a To select Treble, turn the Rotary knob until Treble icon is highlighted. Next, press the On Screen Display button.



4b Turn the Rotary knob to adjust the treble.

4c When done, press the On Screen Display button to save the change and return the screen to Audio Controls.

5a To select Balance, turn the Rotary knob until Balance icon is highlighted. Then, press the On Screen Display button.



5b Turn the Rotary knob to adjust the balance.

5c When done, press the On Screen Display button to save the change and return the screen to Audio Controls.

Smart Help

To exit Audio Controls . . .

. . . *but continue* on to Geometry Controls, turn the Rotary knob until Exit is highlighted. Next, press the On Screen Display button. Then go to step 2a on page 15.

. . . *completely,* press the On Screen Display button and hold for two seconds. The On Screen Display will disappear. All changes will be saved.

To cancel Mute, repeat step 2b, or press the Mute button on the front of the monitor.

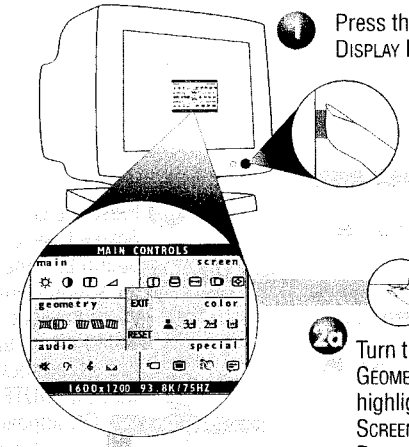
To make changes to one item, follow the steps for that item. Then follow the instructions **To exit Audio Controls . . . .**

How to Use the On Screen Display (OSD)

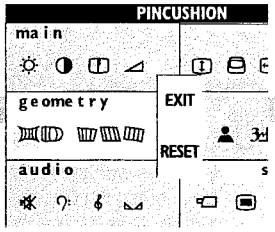
Geometry Controls window

Pincushion, Balanced Pincushion, Trapezoid, Parallelogram, Rotation

Follow the steps below to adjust any of the five preset options (Pincushion, Balanced Pincushion, Trapezoid, Parallelogram, or Rotation). You can make individual adjustments to each of the preset options. *Note: use these features only when the picture is not square.*

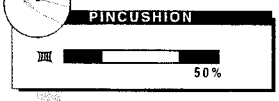


1. Press the On Screen Display button.



2a. Turn the Rotary knob until the Geometry Controls window is highlighted. Next, press the On Screen Display button. Then, if necessary, turn the Rotary knob until Pincushion icon is highlighted.

2b. Press the On Screen Display button. Then, turn the Rotary knob to adjust the pincushion.

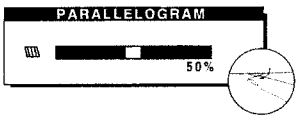


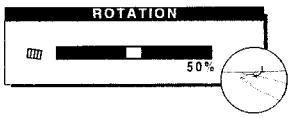
2c. When done, press the On Screen Display button to save the change and return to Geometry Controls window.

3a. To select Parallelogram or Rotation, turn the Rotary knob until Parallelogram or

3b. Rotation icon is highlighted. Next, press the On Screen Display button. Then follow

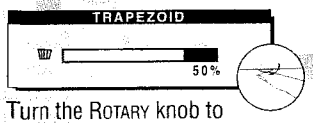
3c. steps 4b and 4c to make the appropriate changes.





3a. To select Balanced Pincushion, turn the Rotary knob until Balanced Pincushion is highlighted. Next, press the On Screen Display button.

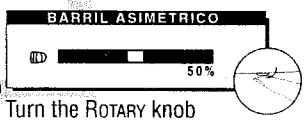
4c. When done, press the On Screen Display button. This will save the change and return the screen to Geometry Controls window.



4b. Turn the Rotary knob to adjust the trapezoid.

4a. To select Trapezoid, turn the Rotary knob until Trapezoid icon is highlighted. Next, press the On Screen Display button.

3c. When done, press the On Screen Display button. This will save the change and return the screen to Geometry Controls.



3b. Turn the Rotary knob (on the lower right-hand corner of the monitor) to adjust the balanced pincushion.

Smart Help

To exit Geometry Controls . . .

. . . but continue to another window, turn the Rotary knob until Exit is highlighted. Next, press the On Screen Display button. Then, turn the Rotary knob until that window is highlighted. Now, press the On Screen Display button and follow theinstructions for that window.

. . . completely, press the On Screen Display button and hold for two seconds. The On Screen Display will disappear. All changes will be saved.

To make changes to one item, follow the steps for that item. Then, follow **"To exit Geometry Controls . . . ."**

To return to factory presets, see "To Reset an Individual Window" on page 16.

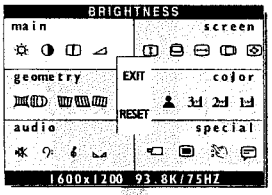
How to Use the On Screen Display (OSD)

Exit and Reset

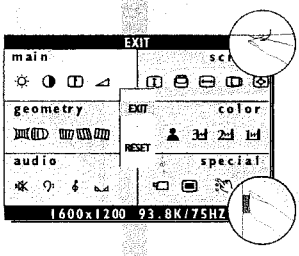
Exit & Reset from a Window

Choosing Exit allows you to go to another window. Choosing Reset returns all the settings in that window to factory presets.

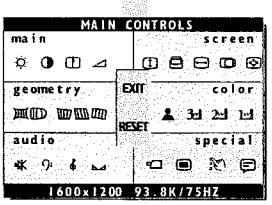
To Exit an Individual Window



1. Make sure you are at a window. For example, Main Controls. An icon will be highlighted. For example, Brightness.

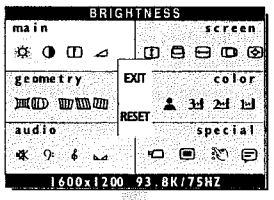


2. Turn the Rotary knob until Exit is highlighted. Next, press the On Screen Display button.

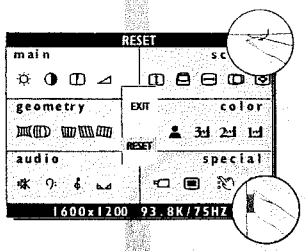


3. An entire window is now highlighted. Turn the Rotary knob to another window and begin adjustments, or turn the knob until Exit is highlighted as shown in Exit from OSD (at right).

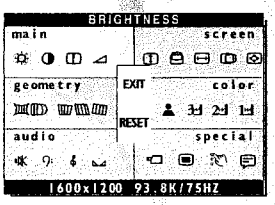
To Reset an Individual Window



1. Make sure you are at a window. For example, Main Controls. An icon will be highlighted. For example, Brightness.



2. Turn the Rotary knob until Reset is highlighted. Next, press the On Screen Display button.

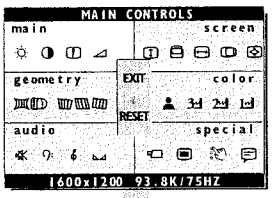


3. The first icon in the reset window is now highlighted. Turn the Rotary knob to select another icon and begin adjustments, or turn the knob until Exit is highlighted as shown above.

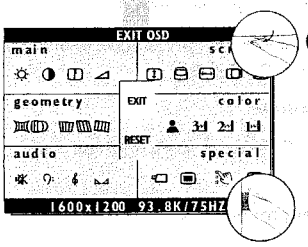
Exit & Reset from the On Screen Display

Exiting from the On Screen Display removes the On Screen Display from the monitor screen. Resetting from the On Screen Display returns everything in all the windows to factory presets.

To Exit an Entire On Screen Display

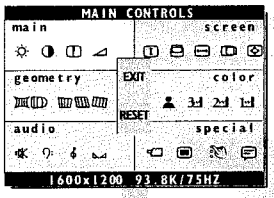


1. Make sure you have exited from all icons in a window. (See To Exit from an Individual Window.) For example, Main Controls will be highlighted.

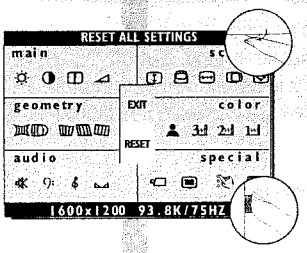


2. Turn the Rotary knob until Exit is highlighted. Next, press the On Screen Display button. The On Screen Display will disappear.

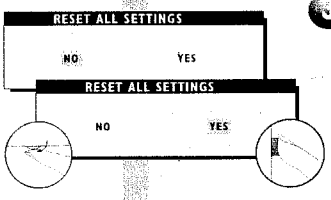
Reset Entire On Screen Display



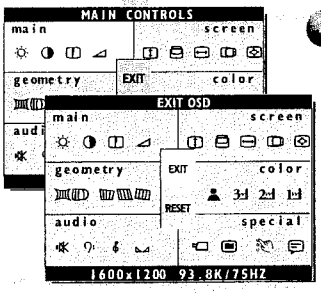
1. Make sure you have exited from all icons in a window. (See To Exit from an Individual Window.) For example, Main Controls will be highlighted.



2. Turn the Rotary knob until Reset is highlighted. Next, press the On Screen Display button.



3. Turn the Rotary knob to select No or Yes. Then press the On Screen Display button.



4. If No is selected, the On Screen Display appears and Main Controls is highlighted.

   If Yes is selected, the Exit OSD screen appears.

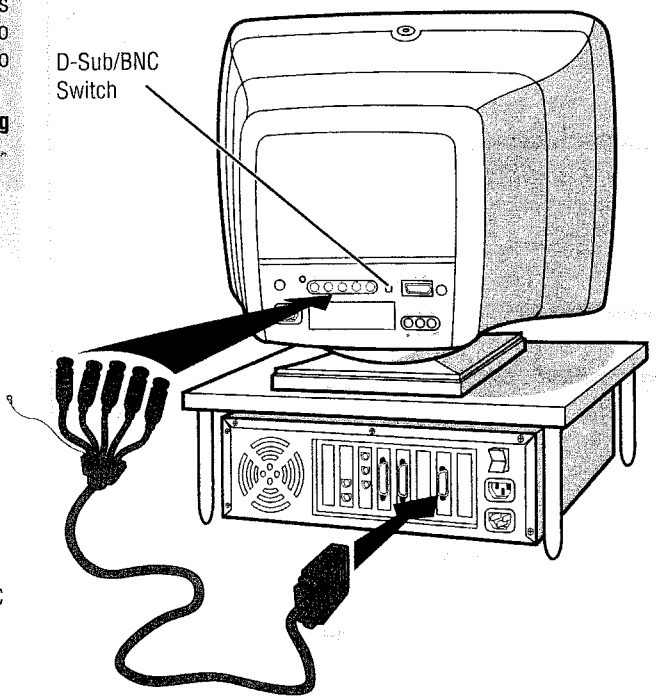
Additional Hook Up Options

BNC and USB Set Ups

BNC Connections

BNC is another way to connect the monitor to the computer. This connection requires an optional BNC cable. It can be connected to either a Macintosh- or IBM-compatible computer. For those who work with graphics or designs, this option may be better.

Note: Be sure to flip the D-Sub/BNC switch to BNC when using this connection.



For an IBM-compatible computer:

1. Turn off the computer.
2. Connect the (optional) BNC monitor cable and set D-Sub/BNC switch to BNC.
3. Connect the power cable.
4. Turn on the monitor. Then turn on the computer.
5. If you have Windows '95, follow the "If you have Windows '95" steps on the Setting Up foldout sheet.

For a Macintosh-type computer:

1. Connect the Mac adapter to one end of the monitor cable.
2. Turn off the computer.
3. Connect the (optional) BNC monitor cable and set D-Sub/BNC switch to BNC.
4. Connect the power cable.
5. Turn on the monitor. Then turn on the computer.

Refer to the "Setting Up your Philips monitor" foldout for a more detailed guide to setting up your monitor.

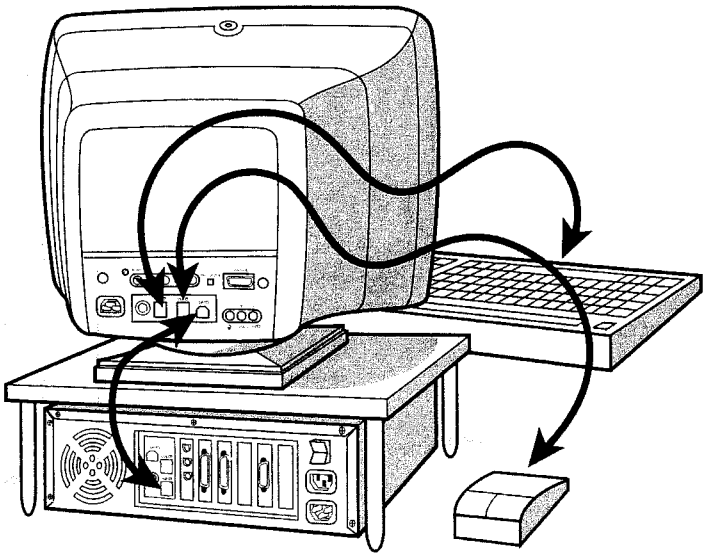
USB Connections

USB (Universal Serial Bus) is an innovation in connecting your IBM-compatible computer to your monitor. By using the USB, you will be able to connect your keyboard, mouse, printer, and other peripherals to your monitor instead of having to connect them to your computer. This will give you greater flexibility in setting up your system. Plus, you will have true plug-and-play capability. While the software is still being developed, Philips has included the hardware so you will be ready to take advantage of this next generation in computer development.

For an IBM-compatible Computer:

1. Turn off the computer.
2. Connect the (optional) USB Hub and cable to the computer and to the monitor. (Computer must have USB port.)
3. Connect the power cable.
4. Turn on the monitor. Then turn on the computer.
5. With the installation of the correct software, you will be able to connect specially-made peripherals to the monitor.

Note: USB Hub and cables sold separately. USB Bay exists in back of monitor.



Refer to the "Setting Up your Philips monitor" foldout for a more detailed guide to setting up your monitor.

Additional Information

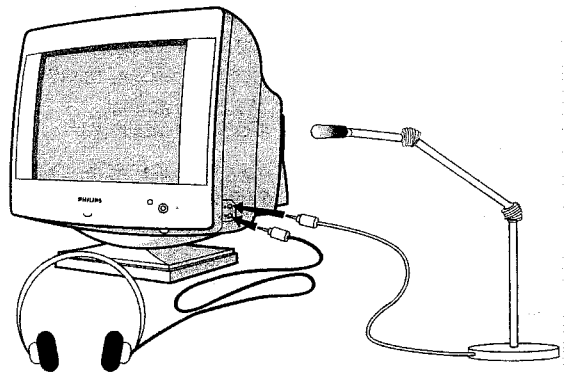
Audio Hook Ups and Power Saving Feature

Microphone and Earphones Jacks

In addition to built-in speakers and microphone, you can connect this monitor to optional earphones and a microphone. The jacks are on the right side of the monitor.

To use the microphone with your computer or an amplifier, make the connections shown below.

Note: When the earphones are plugged in, there will be no sound from the built-in speakers.

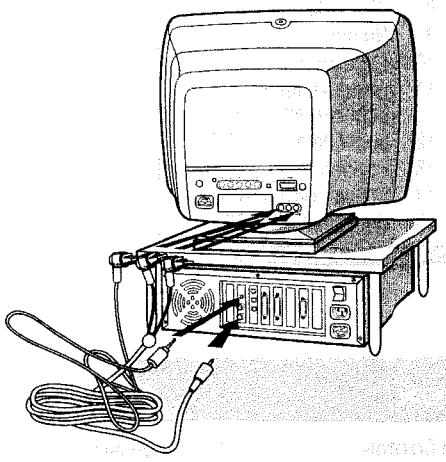


Microphone and Audio-in Jacks

A microphone jack is on the back of the monitor. Use it and the supplied cable to connect your monitor to your computer or an amplifier (if either has the right type of jack).

On the back of this monitor there is also one set of left and right audio-in jacks. Use them and the supplied cable to connect your monitor to your computer or an amplifier (if either has the right type of jacks).

See page 2 for more detailed illustrations of the jacks' locations.



Refer to the owner's manuals included with your earphones and microphone for a detailed guide to setting up these items.

Automatic Power Savings & Preset Resolution Modes

If you have VESA's DPMS compliance display card or software installed in your PC, the monitor can automatically reduce its power consumption when not in use. If input from a keyboard, mouse, or other device is detected, the monitor automatically "wakes up." The table at left shows the power consumption and signalling of this automatic power-saving feature. To turn this feature on and off, see page 12. The table at right shows the 12 factory preset resolution modes. The maximum number of modes is 16. This leaves room for additions.

Power Management Definition

VESA's mode	Video	H-sync	V-sync	Power used	Power saving(%)	LED color
ON	Active	Yes	Yes	<130W	0%	Green
Stand-by	Blanked	No	Yes	< 15W	87.5%	Yellow
Suspend	Blanked	Yes	No	< 15W	87.5%	Yellow
OFF	Blanked	No	No	< 5W	95.8%	Amber

This monitor is Energy Star compliant and power management compatible.

AS AN ENERGY STAR PARTNER, PHILIPS HAS DETERMINED THAT THIS PRODUCT MEETS THE ENERGY STAR GUIDELINES FOR ENERGY EFFICIENCY.

The proper operation of the function requires a computer with VESA DPMS power management capabilities. When used with a computer equipped with VESA DPMS, the monitor is Energy Star compliant.

Factory Preset Resolution Modes

Mode	Resolution	H. Freq. (KHz)	V. Frq. (Hz)	Standard
1	640 x 400	31.5	70	VGA
2	640 x 480	31.5	60	VGA
3	640 x 480	37.5	75	VESA/75
4	800 x 600	46.9	75	VESA/75
5	800 x 600	53.7	85	VESA/85
6	1024 x 768	60	75	VESA/75
7	1024 x 768	68.6	85	VESA/85
8	1152 x 870	69.0	75	MAC
9	1152 x 900	71.8	76	SUN SPARC
10	1280 x 1024	80.0	75	VESA/75
11	1280 x 1024	91.0	85	VESA/85
12	1600 x 1200	93.8	75	VESA/75

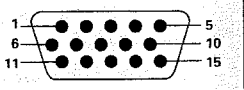
Additional Information

Coming to Terms with this Book

Pin Assignment

The 15-pin D-sub connector (male) of the signal cable:

Pin No.	Assignment
1	Red video input
2	Green video input
3	Blue video input
4	Identical output - connected to pin 10
5	Self test
6	Red video ground
7	Green video ground
8	Blue video ground
9	No pin
10	Logic ground
11	Identical output - connected to pin 10
12	Serial data line (SDA)
13	H. Sync / H+V
14	V. Sync (VCLK for DDC)
15	Data clock line (SCL)



Specifications

General

CRT

Screen size	:19" (43.2 cm) flat & square
Viewable Image Size (VIS)	:17.9"
Focusing method	:Dynamic focus
Dot pitch	:0.22 mm (horizontal)
Phosphor	:P22 or equivalent, medium short persistence
Screen treatment	:Arasc
Display area	
Factory preset	:340 mm (H) x 255 mm (V)
Maximum usable	:364 mm (H) x 272.5 mm (V)
Scanning frequency	
Horizontal (line)	:30-95kHz (AutoScan)
Vertical (frame)	:50-160 Hz (AutoScan)
Input power	:100-240 VAC, 50-60 Hz
Power consumption	:120 Watt normal, 130 Watt max.
Thermal dissipation	:341.3 BTU normal, 409.5 BTU maximum
Input signal	
Video	:0.7 or 1.0 Vpp, 75 Ohm impedance
Sync	:Separate sync. TTL level Composite sync. TTL level
Pedestal	
Tilt	:5° forward, 11° backward
Swivel	:90° left, 90° right
Physical	
Unit dimension (WxHxD)	:485 x 490 x 515 mm (19.1" x 19.3" x 20.3")
Net weight	:24.5 kg (53.9 lbs.)
Operating conditions	
Temperature	:0° C - 40° C
Humidity	:10% - 90%
Storage conditions	
Temperature	:-40° C - 60° C
Humidity	:5% - 95%

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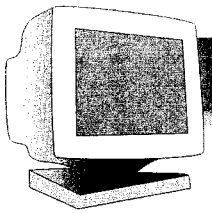
Glossary

Here are a few definitions that may help you.

Degauss	The process by which metal parts of the monitor are demagnetized in order to reduce screen distortion and color impurity.
D-Sub/ BNC	Two ways of connecting your monitor to your computer. Your monitor comes with a D-Sub cable. For work with a heavy emphasis on graphics, a BNC cable is recommended.
Geometry	A set of controls that allows you to adjust the alignment of the picture on the monitor screen. The goal is to "square up" the picture. This is done by adjusting such items as balanced pincushion, pincushion, parallelogram, rotation, and trapezoid.
Moire	A fringe pattern caused by the interference between two superimposed line patterns.
USB	Universal Serial Bus. A way to connect your computer, monitor, and peripherals for true Plug-and-Play functions.



Additional Information

What to Do if Something Isn't Working

Troubleshooting

Having trouble? Something not working? Before calling for help, try these suggestions.

Having this problem?	Check these items
No Picture (Power LED not lit)	Make sure the Power cable is plugged in the wall and back of the monitor. Power button on top of the monitor should be in the ON position. Disconnect the monitor from the power outlet for about one minute.
No Picture (Power LED is Amber or Yellow in color)	Make sure the computer is turned on. Make sure the D-Sub/BNC switch on the rear of the monitor is in the correct position. See pages 2 and 17. Make sure the monitor cable is properly connected to your computer. Check to see if the monitor cable has bent pins. The Energy Saving Feature may be activated. See pages 12 and 18 for more detail.
No Picture (Power LED is Green in color)	Make the Brightness and Contrast controls are set correctly. See page 4 for details Make sure the D-Sub/BNC switch on the rear of the monitor is in the correct position. See pages 2 and 17. Make sure the monitor cable is properly connected to your computer. Check to see if the monitor cable has bent pins. Make sure the computer Power button is on.
Screen says when you turn on the monitor.	Make sure the D-Sub/BNC switch on the rear of the monitor is in the correct position. See pages 2 and 17. Make sure the monitor cable is properly connected to your computer. See Setting Up foldout. Check to see if the monitor cable has bent pins. Make sure the computer is turned on
No Color	If you are using a non-VESA-DDC standard video card, consult your local Philips dealer or service organization to obtain an adapter.
Color appears blotchy	The picture may need degaussing. See page 5 for details. Remove any nearby magnetic objects. Face the monitor East for best picture quality.
Missing one or more colors	Check user settings of Color Temperature. See pages 8 and 9 for details. Make sure the monitor cable is properly connected to your computer. Check to see if the monitor cable has bent pins.
Dim Picture	Adjust the Brightness and Contrast controls. See page 4 for details. Check the Video Input selection and switch from 0.7 volts to 1.0 volts or 1.0 volts to 0.7 volts. See page 13. Check your video card and the manual instructions for it. It may be a non-VESA-DDC Standard card.
Picture is too large or too small	Adjust the Horizontal and/or Vertical Size. See pages 7 and 8 for details.
Edges of the picture are not square	The geometry controls require adjusting. See page 15 for details.
Picture has a double image	Eliminate the use of a video extension cable and/or video switch box. Face the monitor East for best picture quality.
Picture is not sharp	Check to make sure Moire is switched off. See page 11.
No Audio	Make sure mute is not activated. See pages 2 and 14 for details. Rotary Default may be set to Brightness or Contrast. See page 12 for details. Make sure the Right & Left Audio in cable is securely plugged into the monitor and the audio source. See pages 2 and 18 for details.
Unstable Picture	Increase your refresh rate. Consult your computer manual for details.
Windows '95 cannot find your video card	Select "Super VGA" under Standard Display Types, or contact your video card manufacturer for the right drivers.

Setting Up *your Philips monitor*

Installation de votre moniteur Philips.

Configuración de su monitor Philips.

This foldout is designed to help you use your monitor as soon as possible. Refer to your owner's manual for detailed information. You may also contact us at our web site: http://www.monitors.be.philips.com

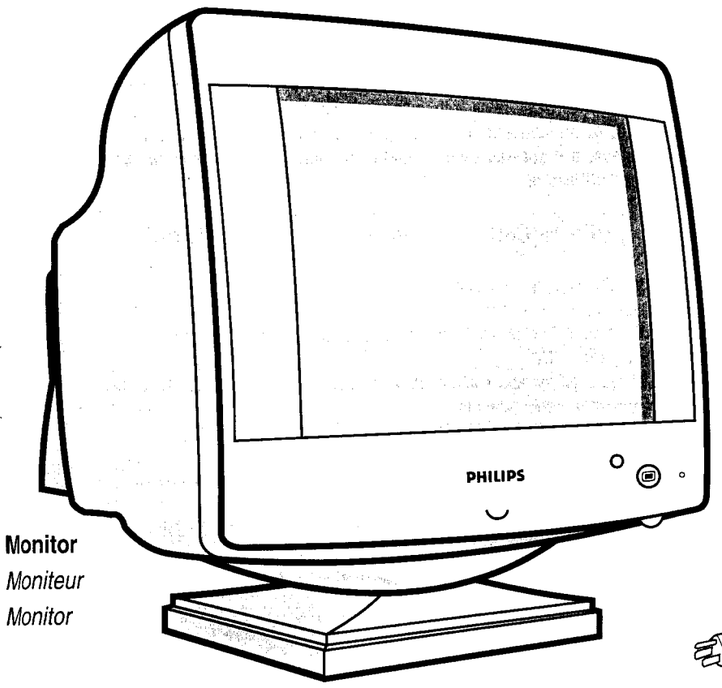
Ce dépliant est conçu pour vous aider à utiliser votre moniteur du plus vite possible. Consulter votre manuel d'utilisateur pour des informations détaillées. Vous pouvez aussi nous contacter sur notre site Web: http://www.monitors.be.philips.com

Esta hoja plegable está diseñada para ayudarle a usar su monitor tan pronto como sea posible. Consulte su manual si desea información detallada. También puede comunicarse con nosotros a través de nuestra página web: http://www.monitors.be.philips.com

To hook up your monitor to a Macintosh-type computer, follow the steps below. To hook up your monitor to an IBM-compatible computer, follow step 1, then turn over this foldout. In either case, before installing this monitor, please refer to the user's guide of your computer and video adapter to see if this equipment needs any additional setting.

Suivre les étapes suivantes pour connecter votre moniteur à un ordinateur du type Macintosh. Pour connecter votre moniteur à un ordinateur compatible IBM, suivre la première étape, puis tourner ce dépliant. En tout cas, avant l'installation de votre moniteur, veuillez vous référer au manuel d'utilisateur de votre ordinateur et carte vidéo pour voir si cet équipement a besoin d'installation supplémentaire.

Para conectar su monitor a un ordenador tipo Macintosh, siga los pasos que se presentan a continuación. Para conectar su monitor a un ordenador compatible con IBM, siga el paso 1, luego voltee esta página. En ambos casos, antes de instalar este monitor, consulte la guía del usuario de su ordenador y de su adaptador de vídeo, para

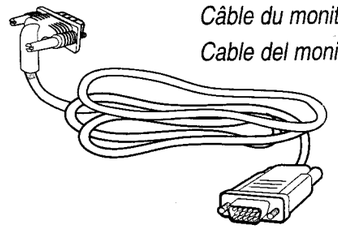


Monitor
Moniteur
Monitor

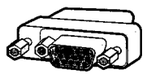
❶ Unpack all the parts.

Déballer toutes les pièces.

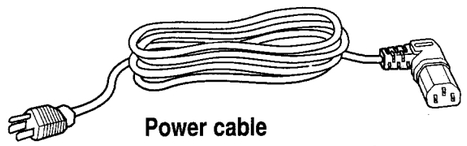
Desembale todas las piezas.



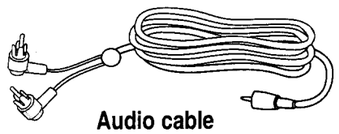
Monitor cable
Câble du moniteur
Cable del monitor



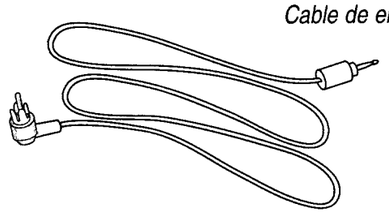
Macintosh adapter (optional)
Carte Macintosh (optionnelle)
Adaptador de Macintosh (opcional)



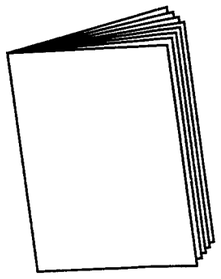
Power cable
(Appearance may vary.)
Câble de puissance (l'apparence varie)
Cable de energía (su aspecto puede variar)



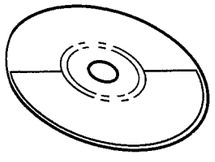
Audio cable
Câble audio
Cable de audio



Microphone cable
Câble du microphone
Cable del micrófono

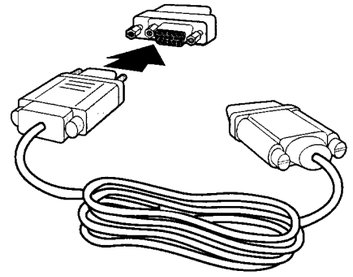


Owner's manual
Manuel d'utilisateur
Manual del propietario



CD ROM or Floppy Disk
CD-ROM ou Floppy Disk
CD ROM or Floppy Disk

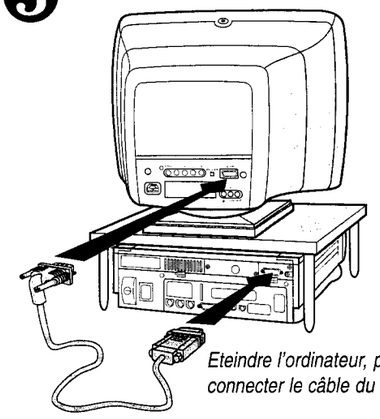
❷ Connect the special Mac adapter (May not be included.) to one end of the monitor cable.



Connecter la carte spéciale Mac (pas toujours inclue) à une extrémité du câble du moniteur.

Conecte el adaptador especial de Mac (puede no estar incluido) a un extremo del cable del monitor.

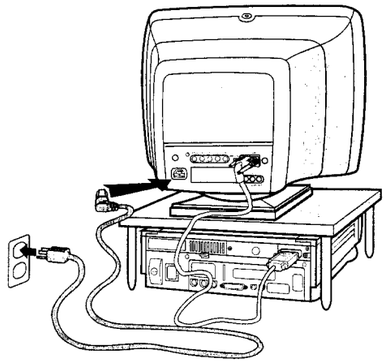
❸ Turn off the computer. Then connect the monitor cable.



Eteindre l'ordinateur, puis connecter le câble du moniteur

Apague el ordenador. Luego conecte el cable del monitor.

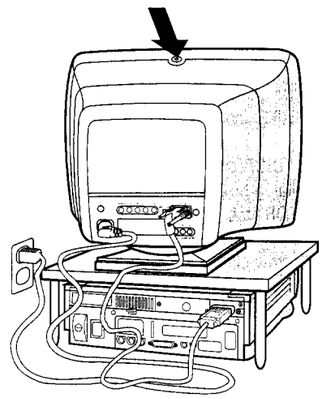
❹ Connect the power cable. Make sure the power plug and the wall socket are easily accessible.



Connecter le câble de puissance. S'assurer que la fiche secteur et la prise murale soient facilement accessibles.

Conecte el cable de energía. Verifique que se pueda acceder fácilmente al tomacorriente y al enchufe de pared.

❺ Turn on the monitor. Then turn on the computer.



Allumer le moniteur, puis l'ordinateur.

Encienda el monitor. Luego encienda el ordenador.

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3138 105 35211
PCS 90 037

Setting Up *your Philips monitor*

Installation de votre moniteur Philips.

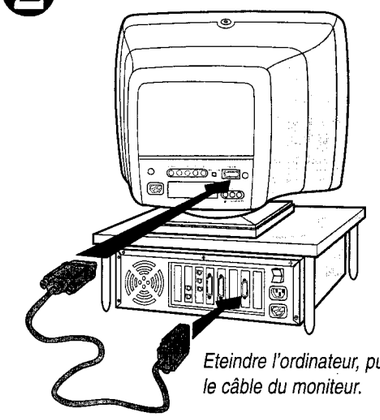
Configuración de su monitor Philips.

IBM-compatible computer hookup continued from step 1 on other side.

Connecter l'ordinateur compatible IBM, suite de la première étape de l'autre côté.

Conexión del ordenador compatible con IBM (continuación del paso 1 del otro lado de la página).

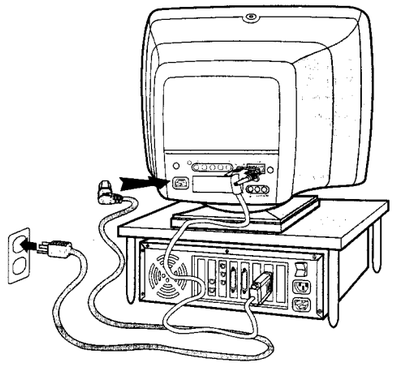
2 Turn off the computer. Then connect the monitor cable.



Eteindre l'ordinateur, puis connecter le câble du moniteur.

Apague el ordenador. Luego conecte el cable del monitor.

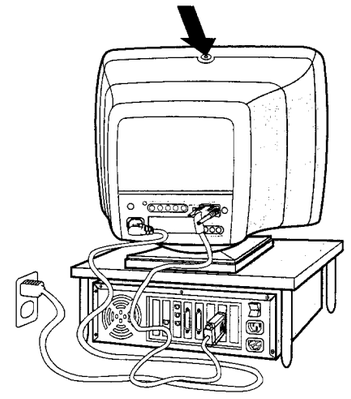
3 Connect the power cable. Make sure the power plug and the wall socket are easily accessible.



Connecter le câble de puissance. S'assurer que la fiche secteur et la prise murale soient facilement accessibles.

Conecte el cable de energía. Verifique que se pueda acceder fácilmente al tomacorriente y al enchufe de pared.

4 Turn on the monitor. Then turn on the computer.



Allumer le moniteur, puis l'ordinateur.

Encienda el monitor. Luego encienda el ordenador.

WHAT TO DO IF YOUR MONITOR ISN'T WORKING

Make sure...
- ...the Power cable is plugged in the wall and the rear of the monitor.
- ...the Power button on top of the monitor should be in the ON position.
- ...the monitor cable is properly connected to the back of the monitor and the computer.
- ...to check to see if the monitor cable has bent pins.
- ...the D-Sub/BNC switch on the rear of the monitor is in the correct position. See pages 2 and 17 of the owner's manual for details.

See page 20 of the owner's manual for troubleshooting tips.
For warranty questions, please see your owner's manual.

QUE FAIRE SI VOTRE MONITEUR NE MARCHE PAS

S'assurer...
- ...que le câble de puissance soit branché dans le mur et à l'arrière du moniteur.
- ...que le bouton Marche/Arrêt au dessus de votre moniteur soit sur MARCHE.
- ...que le câble du moniteur soit bien connecté à l'arrière du moniteur et de l'ordinateur.
- ...de vérifier que le câble du moniteur n'ait pas de fiches tordues.
- ...que l'interrupteur D-Sub/BNC à l'arrière du moniteur soit en position correcte. Voir page 24 et 39 de votre manuel d'utilisateur pour plus de détails.

Voir page 42 du manuel d'utilisateur pour des conseils de dépannage.
Si vous avez des questions concernant la garantie, veuillez consulter votre manuel d'utilisateur.

¿QUÉ HACER SI SU MONITOR NO FUNCIONA?

Verifique...
- ...si el cable de energía está enchufado a la fuente de energía y a la parte posterior del monitor.
- ...si el botón de alimentación en la parte superior del monitor está en la posición ON.
- ...si el cable del monitor está debidamente conectado a la parte posterior del monitor y del ordenador.
- ...que las clavijas del cable del monitor no estén dobladas.
- ...que el interruptor D-Sub/BNC en la parte posterior del monitor esté en la posición correcta. Si desea más detalles, consulte las páginas 46 y 61 del manual del propietario.

En la página 64 del manual del propietario encontrará consejos sobre la localización de fallas.
Para consultas sobre la garantía, consulte el manual del propietario.

If you have Windows '95...

follow these steps to complete setting up your monitor.

1. Start Windows '95 and install CD ROM supplied with this monitor.
2. Click on the "START" icon. Next, click on the "SETTINGS" icon. Then click on "CONTROL PANEL."
3. Double-click on "DISPLAY" icon. Next, click on "SETTINGS" tab. Then click on "ADVANCED PROPERTIES" dialog box.
4. Click on "MONITOR" tab.

5a. If you have an old computer, click on "CHANGE" dialog box. Next, "SELECT DEVICE" screen appears. Now click on "HAVE DISK" dialog box. and select CD-ROM drive

Or

5b. If you have a new computer, "SELECT DEVICE" screen automatically appears. Click on "HAVE DISK" dialog box and select CD-ROM drive.

6. Select "OK" in the "INSTALL FROM DISK" dialog box. If model name of the Philips monitor is correct, click "OK" tab in the "SELECT DEVICE" dialog box.
7. Click "CLOSE" tab in the "ADVANCED PROPERTIES" dialog box. If your Windows '95 version is different or you need more detailed installation information, please refer to the Windows '95 user's manual. **For additional information on the monitor, please refer to the owner's manual.**

Si vous avez Windows '95...

suivez les étapes suivantes pour terminer l'installation de votre moniteur.

1. Démarrer Windows 95 et installer le CD-ROM fournit avec votre moniteur.
2. Cliquer sur l'icône "DEMARRER", ensuite, cliquer sur l'icône "PARAMETRES", puis cliquer sur l'icône "PANNEAU DE CONFIGURATION".
3. Cliquer deux fois sur l'icône "AFFICHER", ensuite cliquer sur l'onglet "PARAMETRES", puis cliquer sur la boîte de dialogue "PROPRIETES AVANCEES".
4. Cliquer sur l'onglet "MONITEUR".

5a. Si vous avez un ancien ordinateur, cliquer sur la boîte de dialogue "CHANGER". ensuite l'écran "SELECTIONNER UNITE" apparaît. Maintenant cliquer sur la boîte de dialogue "DISQUETTE FOURNIE", et sélectionner le lecteur CD-ROM.

ou

5b. Si vous avez un ordinateur récent, l'écran "SELECTIONNER UNITE" apparaît automatiquement. Cliquer sur la boîte de dialogue "DISQUETTE FOURNIE" et sélectionner le lecteur CD-ROM.

6. Sélectionner "OK" dans la boîte de dialogue "INSTALLER A PARTIR DE LA DISQUETTE". Si le nom du modèle de moniteur Philips est correct, cliquer sur l'onglet "OK" dans la boîte de dialogue SELECTIONNER UNITE"
7. Cliquer sur l'onglet "FERMER" dans la boîte de dialogue "PROPRIETES AVANCEES". Si votre version Windows 95 est différente ou si vous voulez des informations plus détaillées sur l'installation, veuillez vous référer au manuel d'utilisateur de Windows 95. **Pour des informations complémentaires sur le moniteur, veuillez vous référer au manuel d'utilisateur.**

Si tiene Windows '95...

siga estos pasos para finalizar la configuración de su monitor.

1. Inicie Windows '95 e instale el CD ROM que se suministra con su monitor.
2. Haga clic en el icono "INICIO". Luego haga clic en el icono "CONFIGURACIÓN". Luego haga clic en "PANEL DE CONTROL".
3. Haga doble clic en el icono "PANTALLA". A continuación haga clic en la etiqueta "CONFIGURACIÓN" y luego en el cuadro de diálogo "PROPIEDADES AVANZADAS".
4. Haga clic en la etiqueta "MONITOR".

5a. Si usted tiene un ordenador viejo, haga clic en el cuadro de diálogo "CAMBIAR". Luego aparece la pantalla "SELECCIÓN DE DISPOSITIVO". Ahora haga clic en el cuadro de diálogo "UTILIZAR DISCO" y seleccione la unidad CD-ROM.

O

5b. Si tiene un ordenador nuevo, aparece automáticamente la pantalla "SELECCIONAR DISPOSITIVO". Haga clic en el cuadro de diálogo "UTILIZAR DISCO" y seleccione la unidad CD-ROM.

6. Seleccione "ACEPTAR" en el cuadro de diálogo "INSTALAR DESDE DISCO". Si el nombre del modelo del monitor Philips está correcto, haga clic en la etiqueta "ACEPTAR" del cuadro de diálogo "SELECCIÓN DE DISPOSITIVO".
7. Haga clic en la etiqueta "CERRAR" del cuadro de diálogo "PROPIEDADES AVANZADAS". Si su versión de Windows '95 es diferente o necesita información más detallada acerca de la instalación, consulte el manual del usuario de Windows '95. **Si desea información adicional acerca del monitor, consulte el manual del propietario.**